THE WILL-TEMPERAMENT AND ITS TESTING

DOWNEY

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THE WILL-TEMPERAMENT AND ITS TESTING

By
JUNE E. DOWNEY, Ph.D.
Professor of Psychology
University of Wyoming

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A few especially discerning individuals are able to gauge the human beings about them with a high degree of accuracy, but the average person's judgments of his fellows are astonishingly incorrect. A scientific analysis of the human personality that will permit the forming of an objective and accurate estimate of abilities and traits is, therefore, to be welcomed. Dr. Downey's *The Will-Temperament and Its Testing* embodies the results of what is probably the most successful attempt yet made to measure elements other than intelligence in the human personality, and the publishers recommend this discussion of them and of the qualities they disclose to all students of human nature

DWTIT-I

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PREFACE

WORK on temperamental testing is still in the pioneer stage; it is, therefore, with some diffidence that I present this book on *The Will-Temperament and Its Testing*. But the many requests that come to me for information with regard to my tests indicate that the interest they have aroused is widespread and suggest the necessity of supplying a background if they are to be used without misunderstanding their purpose. The present-day groping after methods to use in analysis of personality justifies, I believe, the presentation of suggestions rather than ripened conclusions.

I have drawn freely on my previous publications on the topic, particularly from material appearing in the third *Bulletin of the Department of Psychology*, University of Wyoming; in the *Journal of Educational Psychology*, *Journal of Experimental Psychology*, *Journal of Applied Psychology;* and in *School and Society*. To those who have given permission to use such material I extend my thanks.

For other courtesies I am also indebted to the Boston Psychopathic Hospital, to the University of Chicago, the University of Wyoming, and the Laramie Public Schools, and to the many individuals who have served me as subjects or sent me reports of their work with the tests.

I am particularly indebted to Dr. M. J. Ream, formerly of the Personnel Bureau of the Department of Applied Psychology, Carnegie Institute of Technology, and to my colleague, Louisa C. Wagoner.

JUNE E. DOWNEY

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THE WILL-TEMPERAMENT AND ITS TESTING

CHAPTER ONE

Human Individuality

MOST conversation, it has been said, is either biographical or autobiographical. *What* men do and *why* they do it is quite the most absorbing topic for discussion. Speculation on human motives may be prolonged to the small hours of the night, as every family knows that has been shut out of a will or is related to a speculator in the matrimonial market!

Interest in human personality

But analysis of human nature is not merely a fascinating pastime; cleverness at it is very often one element in worldly success. The orator, for example, knows how to play upon human emotions; the miracle-woman how to manipulate a crowd. Keenness in anticipating his neighbor's wants may make a man a merchant prince; judgment in selecting his lawyer, a successful monopolist. Knowledge of one's own assets and liabilities may prove one's best insurance against failure. Great problems of vocational guidance and of social organization wait for solution upon expert and assured reading of human personalities. There can be no real international statesmanship until the intellectual and emotional equipment of different races is more adequately understood.

Keenness in reading human nature

Short-cut methods of character analysis

So vital is this matter of understanding and exploiting human individuality that since the dawn of history attempts have multiplied to penetrate the secret of it by some short-cut method. With some of these attempts we are all familiar. For example, the effort to read one's character and destiny from the position of the planets and the stars at the hour of one's birth! Or the attempt to read character from the lines in the palm of the hand, the bumps on the head, the elevation of the nose, or the crimping of the ear. One after the other such short-cut methods have been discredited.

Psychology attacking the problem

Meanwhile throughout the centuries a real science of human nature has been developing. Rejecting short-cut and spectacular methods of reading human differences, it has gradually accumulated a fund of information through patient observation and comparison of records. At times it has shut itself up in library or laboratory and refused to enter into close contact with life or to lend its capital out for everyday uses. Recently it has come out into the open and made its first attempt to attack the problems of life in the arena of life. It seeks to become serviceable without ceasing to be scientific.

Personality complex

Even a bare cataloguing of human traits is no easy task. It involves teasing apart closely interwoven threads. For purposes of brief comment let us distinguish phases of intelligence; an instinctive, an emotional, and a temperamental equipment; possibilities of habit formation; and an energy output.

Intelligence ranges from the bare sensing of the

qualities of the outside world to creation of a great orchestral symphony or system of thought, and at every step on the march enter surprising individual differences. Psychology has introduced us to many an amazing possibility in variation in sense organs. It has, for example, acquainted us not only with the color-blind individual but also with the man color-blind in one eye alone, one of Nature's curious experiments, who, wherever discovered, should be appropriated by the state as a bit of laboratory apparatus! It has sought out the man of nocturnal vision and suggested that he serve as night guard in trench or city. It has listed the vagaries of the pitch-deaf person, and of the anosmic woman, so insensitive to odor that every pot on the stove might boil dry without that symphony of odors attracting a single glance of appreciation.

Individual differences in sensory equipment

In the world of imagery, psychology has discovered the eye-minded individual, whose thoughts resemble flickering movies; the ear-minded man, whose ideas echo largely in inner speech; and the motor-minded man, whose inner thinking goes on in terms of vocal movements or delicate gymnastics, or subtle gestures by hand or eye-muscle which convey an immense amount of meaning by a method of mental shorthand. Individual differences in powers of reasoning are too obvious to need comment, since they range from going indoors when it rains to invention of a phonograph or a Liberty motor. Even to list the discoveries of psychology in the way of intellectual differences would require a small volume.

Differences in imagery and in reason

Instincts

But man is not pure intellect; he is, very largely, the creature of instinct, a fact ignored for generations by the student of human nature and by the social sciences in general. Not, in fact, until biology came into its own and its point of view began to dominate the thought of the world did psychology realize that the life of the individual is rooted in his instincts, not in his intellect, that it is the former which creates the desires that initiate and the drive that fosters mental activities. The problem today is to determine the varieties of instinct that the human being possesses. Apparently they range from clear-cut patterns of behavior—definitely inherited reactions to a constant environment—to more or less vague and general tendencies inherited in crude outline only. Theoretical classifications have been worked out with frequent appeal to forms of instinct as they appear in the lower animals. There are listed the instincts that make for preservation of the individual, such as feeding, acquisitiveness, fighting, and flight; those that keep the species in existence, such as mating and parental instincts; those that hold the group together, such as gregariousness and sympathy; and, in addition, such pattern types of behavior as exploration, migration, and play.

Instincts need to be analyzed

The pressing need today is for a more penetrating analysis of the inherited instincts that govern behavior, after first stripping them of the overlay of habit due to social pressure. Only by a study of instinctive activities as manifested in the infant, where every stimulation from outside can be recorded and

every modification registered, shall be able to determine where instinct ends and habit begins, and determine the relative potency of heredity and environment. A beginning of such absolutely essential analysis has been made by Dr. John B. Watson. The procedure he has initiated will, if carried out thoroughly, not only inform us concerning the inherited instincts that govern behavior but also reveal to us the degree to which different instincts vary in strength in different individuals.

Habit obscures instincts

This latter problem is a fundamental one in the study of varieties in human personalities, for if different instincts vary greatly in strength in different individuals we have discovered undoubtedly a very deep-cutting difference and one which may suggest the type of organization to be anticipated. For example, a strong flight instinct in combination with a weak fighting one would definitely color the whole personality. It might even motivate the development of intelligence, since the timid individual, being continually on guard, would have motives for paying attention to details in his environment—such as a frown on a companion's face or a flicker of fire—that would escape his fearless companion, confident of his ability to extinguish either frown or fire if a real emergency should arise. It is your friend who is temperamentally on the defensive who cultivates both philosophy and policy; it is the one who is temperamentally on the aggressive who launches airships and social revolutions.

Individual differences in instinct

A strong instinct of fear will color the whole personality

The organization of native tendencies into habit-

Instincts color habits

patterns affords another angle of approach to personal differences, for these so-various instincts may be woven into myriad patterns by environment. There is no end to the questions one might phrase concerning complications of instinct and habit. Why, for example, does the wise child under scrutiny of the examining teacher freeze into position, with downcast eyes? Why does every audience except one that pays dearly for the privilege need gentle allurement to sit frontward? Why is the end seat in a church so irresistibly attractive? Why are some of your friends so averse to a correspondence via post card? Why do others communicate by telegraph?

Self-assertion and self-depreciation

In cataloguing the traits of a given personality one would certainly wish to include all manifestations of self-assertion, such as the tendencies to assume leadership, to form independent opinions, to keep one's head unbowed even under the bludgeoning of Fate. Or, on the contrary, a lack of self-assertion, a tendency to self-depreciation, a feeling of inferiority. One's attitude toward others, from that of taking advice to giving it, is also an essential phase of human personality.

Individual differences in habit-making and habit-breaking

The bare facility with which habits are formed at all is an interesting variation in human beings. Not every burnt child dreads the fire; some require a series of burns. One politician learns how to amend his manners from one election; others need several. Not the least important item with reference to habit-making and habit-breaking is the ease or difficulty with which each is done. Your irrevocably set in-

dividual for whom a change in dinner hour is equivalent to a convulsion of nature; your housewife whose habits of work are part of the calendar; your bromidic friend from whom you can elicit the appropriate remark by punching the right button, all exemplify those individuals who under the influence of habit become stereotyped, deeply stamped with the mintage of society. Absolutely to be trusted to do the expected thing, at the expected time, they furnish no thrills to life. To get these we apply to the live wire who reduces his habits to a necessary minimum and avoids routine as death to the soul.

The output of energy

The general level of energy has much to do with the number of habits acquired and the liveliness with which one goes through his repertory of possible activities. The quick step of the man with high output of energy contrasts with the sluggish movements of him whose reservoir of energy is low. The man whose every movement counts, balances the one who wastes much of his activity in useless movements.

Emotional susceptibility

In addition to instinctive equipment and level of energy we recognize, also, emotional susceptibility as part of the human personality. This varies tremendously from one individual to another. One angry word—or a caressing one—may be sufficient to throw one individual off balance; an arsenal of such weapons is useless against an imperturbable Franklin or an experienced flirt. His "moodiness" is an important item of information about your companion in order that you may discount alike a

dismal cast of countenance and an over-optimistic proposal that you purchase bonds.

Insane types, exaggerated forms of normal temperament

A recent departure in the study of human personality draws very largely upon the exaggerated patterns that one sees in the institutions for the mentally unbalanced. Professor Jastrow's conception of the abnormal as "the assets and liabilities of specialized temperaments" tempts us to look for similarities in general pattern between characteristic normal temperaments and definitely recognized pathological types.

Rosanoff: four types of personality

A most interesting attempt to relate varieties of normal personality to psychotic or insane types is that of Dr. Rosanoff, the well-known psychiatrist, who maintains that normal personalities differ from psychopathic ones quantitatively rather than qualitatively. Dr. Rosanoff,[1] for purposes of classification, lists four types of personality which may develop into abnormal ones, as follows:

1. The antisocial type

(1) *The antisocial personality*, which underlies hysterical manifestations and shows itself in social life in lying and swindling and malingering. It may develop into the dual personality.

2. The cyclothymic type

(2) *The cyclothymic personality*, a highly unstable type characterized by ups and downs of which there are four varieties: manic make-up, depressive make-up, irascible make-up, and emotional instability.

(*a*) The manic make-up. The mildest forms of the manic personality "lead us toward certain make-

[1] "A Theory of Personality Based Mainly on Psychiatric Experience." *Psychological Bulletin*, Vol. 17, 1920.

ups of personality which are in the domain of the normal. Here we deal with brilliant but unevenly endowed individuals with artistic inclinations. They delight us with their nimbleness of spirit, their versatility, their multiplicity of ideas, their alert open-mindedness and spirit of enterprise, their artistic ability, their kind-heartedness, their gay, sunny disposition." In the asylum we find the "exalted" person of grand notions, "wild flight of ideas," and utter irresponsibility.

(*b*) The depressive make-up. In the depressive make-up there exists, on the contrary, from youth "a special sensitiveness to the cares, troubles, and disappointments of life. They take all things hard and feel the little unpleasantnesses in every occurrence much more strongly than the elevating and gratifying aspects of unconcerned and happy enjoyment, of unreserved surrender to the future." In its exaggerated form we get the "melancholiac," sunk mentally and physically in deepest despair.

(*c*) The irascible make-up. The irascible make-up is characterized by extraordinarily fluctuating emotional equilibrium. Irascible persons are hot-headed, easily offended, given to violent scenes, with rapid changes in emotional coloring. This type may develop into the "maniac" as popularly conceived.

(*d*) The unstable make-up. Persons with emotional instability "swing back and forth between the two opposite poles of emotion, now 'shouting with joy to heaven,' now 'grieved to death.'" In the asylum this individual runs the gamut from mania to

depression, sometimes alternating moods with great regularity.

3. The shut-in type

(3) *The autistic* or *shut-in personality* is the basis on which may develop dementia precox, a disease characterized in many of its forms by mental deterioration, emotional apathy, and dissociative phenomena. In this type of personality we find the vague, dreamy, detached person who shows a reduction of external interests and a tendency to lose contact with reality. He is shy and apt to live in a world of fancy.

4. The epileptic type

(4) *The epileptic personality* is violent, headstrong, given to violent likes and dislikes, and brief periods of inspiration or moods of ecstasy or avalanche of ideas, so fitly described by Dostoyevsky from personal experience. The epileptic, recognizably abnormal, is characterized by his "seizures," his lapses of memory, his tendency toward violent acts.

All these varieties of personality, Rosanoff explains, have value in their normal form. The antisocial trend underlies much of our prudence, diplomacy, success in commerce and politics; the sensitiveness and expressiveness of the cyclothymic personality find outlet in literature and dramatic art; the autistic personality, which shuts away every diverting influence, may accomplish great things in scientific research; the epileptic personality, stubborn and inspired, may become a great reformer or religious leader.

Mixed types

Several trends may unite in one individual. "Mixed types are the rule, pure types the exception."

Moreover, the normal types show, what is so conspicuously absent in the abnormal, the presence of such balancing factors as power of inhibition, emotional control, durability of mind, and nervous stability.

Maintenance of balance

In part, maintenance of balance is an outcome of adjustment to one's environment, and adjustment is obviously a much more difficult matter in some environments than in others. One of the really vital questions about any individual is how much strain he can stand without losing balance. Modern warfare and, indeed, modern life in general put the balancing factors to a severe test.

Over- and under-active temperament

Descriptive psychology has often cast about for a term applicable to big patterns of organization, comprehensive enough to include many phases in its scope. Temperament is a word that has been used to cover many tendencies. Davenport,[1] in his analysis of temperament, emphasizes as fundamental to its varieties the contrasting trends called by him (after Southard) "hyperkinesis" and "hypokinesis." Hyperkinesis involves increased activity and elated emotional tone; hypokinesis, decreased activity and lowered emotional tone. Alternating cycles from hyperactivity to depression are not uncommon.

To quote Davenport: "We have seen that at one extreme of the population are to be found overactive, jolly persons; at the opposite extreme the exceptionally quiet and sad." Between lie the vast majority of people, showing, however, an inclination toward

[1] "Inheritance of Temperament." *Carnegie Institution Publication.*

one condition or the other. Ostwald, in his treatment of geniuses, found the same two types and separated them "into the romantics and the classics, and says they differ in the rapidity of their reactions. The classics are the slower, the romantics the swifter, and these types he correlates with the four temperaments of the older psychology, in that the sanguine and choleric are the quickly reacting temperaments; the phlegmatic and melancholic the slowly reacting temperaments; and of these the choleric and melancholic represent the extreme types." Davenport contrasts, in scientific work, Agassiz, the delightful teacher, with Helmholtz, the profound investigator; in business, the bold energetic promoter with the solid merchant; in law, the emotional jury-lawyer and the learned judge; in war, a dashing Sheridan and a solid, quiet Grant. He concludes: "The romantic and the classic type, the hyperkinetic and the hypokinetic, the radical and the conservative, the feebly inhibited and the strongly inhibited, constitute a dualism that runs through our whole population."

Explosive and obstructed types

James, writing long before Davenport, had covered somewhat the same ground in his description of the contrasting types of will, which he had labeled the *explosive* and the *obstructed* types.

James's entertaining account of the explosive person will no doubt be recalled.

> An explosive Italian (he writes) with good perception and intellect will cut a figure as a perfectly tremendous fellow, on an inward capital that could be tucked away inside of an obstructed Yankee and hardly let you know

it was there. . . . It is the absence of scruples, of consequences, of considerations, the extraordinary simplification of each moment's mental outlook, that gives to the explosive individual such motor energy and ease. . . .[1]

James recognizes that extreme types occur infrequently and he stresses the need of distinguishing between two possible forms of the explosive and obstructed wills, respectively. An explosive will may be due to exaggerated impulsion or to deficient inhibition; an obstructed will may be due to insufficient impulsion or to excessive inhibition.

Motor and sensory individuals

From still another angle of approach, Baldwin gives us a classification similar in its outcome. He speaks of a sensory and a motor type of person. Of the latter he says:[2] "He tends to act promptly, quickly, unreflectively; generally such a person, child or adult, is said to jump at conclusions. Psychologically such a person is dominated by Habit." He is domineering and self-assertive; the man of action. The "sensory child is passive, more troubled by physical inertia, more contemplative when a little older, less apt in learning to act out new movements, less quick at taking a hint." The sensory individual is the observer, the thinker; he is non-suggestible, non-expressive, non-self-revealing.

Extroverted and introverted types of person

A most valuable distinction in personality study has been elaborated in recent psychology in Jung's conception of the introverted and extroverted type. Extroversion is defined as the pushing out of interest

[1] *Psychology*, Vol. 2, Chapter 26.
[2] *Story of the Mind*, pages 166–200.

on to life and introversion as the withdrawal of interest from life.

Extrovert

Maurice Nicoll, in his delightful *Dream Psychology*, writes as follows:

> Extroversion to some people presents no difficulties. They come in contact with life eagerly, spontaneously, without preparation or plan. They are that large group of people who are sociable and who accept social values unquestioningly. They flow out into action and into emotional contact very easily; they express sympathy, delight, sorrow, appreciation, disgust, indignation, and jealousy without any difficulty. The extrovert, because of the littleness of the barrier between feeling and its expression, is always destined to undergo a series of typical experiences. He must constantly plunge into situations where previous thought would have deterred him. . . . He rarely does anything so cold and detached as merely to attend a function. He assists at a spectacle, at a speech, at a party, because he feels it all without any check to the expression of his feelings. . . . The great actresses, most of the great popular actors, all the great rhetoricians, and the majority of the great preachers are of extrovert psychology. They are essentially public people; they are in contact at once with the crowd. . . . Because of the brilliancy of their feelings when they think a wrong exists they move heaven and earth to get the wrong righted. [But they rarely go to the root of anything and since they have little self-knowledge and judge themselves largely from the effects they produce they often show remarkable inconsistencies.] It is amongst extroverts that we must search for the prodigious, the amazing, and the incredible in history. The great adventurers, the great bluffers, the great squanderers and humbugs, the people who seem to stand beyond the reach of reason and logic, are extroverts. Argument

does not touch them. Their serenity and invulnerability in certain cases are little short of miraculous.

The introvert furnishes a contrast in every particular. Let us quote Nicoll again. **Introvert**

Interest persistently turns inwards, away from the contact of the world, and finds its easiest and most natural utilization in thought. The introvert type, in its most characteristic expression, is reserved, outwardly cold, guarded, watchful, and difficult to understand. Unlike the extrovert, who hides little, the introvert hides everything because he dreads the exposure of his emotions, because they are too raw and intense. . . . Thus the introvert tends to be helpless when in an atmosphere of strong feelings. He is thoroughly aware of his inner life, and is a keen and serious critic of himself. . . . His plans are exhaustive and cast with an eye continually fixed on the possibility of failure. In this his organizing powers exceed those of the extrovert, who rushes into plans confident of success and impatient of the suggestion of failure. The extrovert will exist happily in positions of great danger, serenely conscious or serenely confident, seeing only the omens that herald success; the introvert sees the danger-signals to the exclusion of the possibilities of success, unless he is well-balanced. . . . The introvert who has learnt his weakness and balanced his fears may be as daring and original a leader as the high type of extrovert; indeed, he may far surpass him, as in the case of Napoleon. But the point of importance to remember, in contrasting him with the extrovert, is that he knows himself, if he knows nothing else, whereas this is one of the last things that the extrovert learns. . . . To the introvert the extrovert is a source of amazement; while to the extrovert the introvert is an object of impatient speculation and uncertainty.

Attempt to read human types from physical appearance

The types we have been describing have been discovered largely through prolonged observation of the behavior and life history of individuals. The discredited systems of character analysis to which we referred previously sought in the main to size a man up from his looks. They believed that personality was revealed by physical appearance. The traditional character reading is done by noticing the physical type. Recall, for instance, Plutarch's remark on Cæsar, that he never reckoned with fat men and smooth-combed heads but most feared pale-visaged and carrion-lean people. Although scientific work has thrown into the discard systems of phrenology and physiognomy which have been popular in their day, new methods of analyzing character and temperament from physical characteristics continually bob up. And it is within the range of possibilities that the day may come when we shall be able to interpret the hieroglyphics of human structure. First, however, the anthropologists and anatomists must make innumerable measurements and by correlation between them establish the fact that physical types exist. After that they have to determine the meaning of such types in terms of temperament and intelligence. In illustration of the kind of work that must be done and has, in fact, been inaugurated, let us cite Naccarati's recent investigation [1] where he found evidence of positive correlation between the degree of intelligence and the

[1] "The Morphologic Aspect of Intelligence." *Columbia University Contributions to Philosophy and Psychology*, Vol. 27, No. 2.

"morphologic index," which is, approximately, the ratio of height to weight.

Physicians in their diagnosis and treatment of disease frequently recognize somatic or body types. The carnivorous and herbivorous types of Bryant and Treves have obtained recognition, and the narrow and broad-backed types of Goldthwait. During the recent war considerable was said of placing men in their proper jobs by observation of structure; four somatic types were recognized—namely, the digestive, the respiratory, the muscular, and the cerebral type of man.

Somatic ty

Many anthropologists have great confidence in the possibility of establishing structural types. Bean, writing in *Science*, 1921, on "Anthropology in the Medical Curriculum," says:

> The type may be decided by a careful inspection of the external form of the ear, nose, face, head, and body form after one has become familiar with the types by prolonged experience. It is possible by the ear form alone to determine differences of 10 feet in the length of the small intestine, of 500 grams in the weight of the liver, differences in the size of the brain, cerebellum, heart, kidneys and spleen, in the position and shape of the viscera. . . . Different human types represent different forms of intellect and different immunities and susceptibility to disease, hence psychology and pathology become associated with anatomy and anthropology.

Another sentence from Bean brings us to a consideration of glandular types of which so much is being made today. Says Bean, "Adult human types

probably represent the end products of chemical reactions that have been continuously at work throughout the life of the individual—it is only fair to assume that the net result of this activity will be easier to perceive than the chemical reaction at any particular moment."

Glandular types

An optimistic and highly speculative account of the glandular types is found in Berman's recent book, *The Glands Regulating Personality*. Here we find the chemistry of the soul preached with great enthusiasm and personality types classified on the basis of the glandular secretion that is conspicuous either by its absence or by its presence in the human make-up. "The internal secretion formula of an individual may, in the future," Berman writes, "constitute his measurement which will place him accurately in the social system." Let us list the main ductless glands whose excess or deficiency of secretion gives color to the personality. These are: (1) the pituitary, of which a distinction is to be made between anterior and posterior portions as differing in function; (2) the thyroid; (3) the thymus; (4) the sex glands; (5) the adrenal, also twofold in structure, cortical and medullary.

If the bodily economy is dominated by the secretion of the anterior pituitary gland we have, according to Berman, the masculine masterful domineering type; with the posterior dominating, the feminine imaginative artistic type. With a deficiency in anterior pituitary we get lethargy, indolence; with deficiency of the posterior pituitary, coarseness and

lack of imagination. Energy is supplied by sufficiency of thyroid secretion, while an excess causes restlessness, lack of control, and excessive emotionality. Thyroid deficiency gives the inert individual or, if extreme, one form of feeble-mindedness. The thymus gland is the gland of childhood; if it persists in adult life we have persisting infantile qualities, such, for instance, as homosexuality. The sex glands determine maleness and femaleness, physical and mental. The adrenal glands, when properly functioning, endow the individual with endurance, vigor; when deficient in functioning cause lack of vitality, neurasthenia.

Glandular types illustrated

Out of these possibilities Berman constructs his personality types, choosing as illustrations historic characters. Cæsar is chosen as showing a most extraordinary balance in differing aspects of personality as an outcome of his endocrinal or glandular formula, which was determined by the excellent functioning of all the glands. Napoleon is cited as a pituitary-centered individual, antepituitary superior, postpituitary inferior, with an instability of both that led to his final degeneration. The Little Corporal's pugnacity, animality, and practical genius argued for a superb adrenal; and his insatiable energy pointed to an excellent thyroid. Darwin is said to have lived the life of a hyperfunctioning pituitary, with, in addition, thyroid excess and adrenal deficiency, a combination "settling the fate of a grand intellect in an invalid."

If one may judge from reading Berman, the iden-

Physical characters determined by the glandular formula

tification of a glandular type turns largely upon observation of bodily characteristics or study of life-history. In the latter case one is very likely arguing in a circle in the attempt to cite as proof of glandular make-up personality types which are chosen as being representative of what the type should be like if it existed! The identification of glandular reactions by means of physical characters is on sounder grounds, since it seems to be established that the size and prominence of the bones of the body, the quality and quantity of hair and its distribution on the body, the size and shape of the hand, the texture and moisture of the skin are largely influenced by one's glandular make-up. Giant and dwarf are probably such because of the improper functioning of the pituitary; the fat boy and the hairy man of the circus side-show must thank their ductless glands for putting them on exhibit.

Present-day interest in the ductless glands, medical experiments on glandular feeding, and the outcome of surgical operations promise much information in the future. Meanwhile the correlation of glandular formula with temperamental or intellectual make-up can only be formulated tentatively, and since the determination of the glandular formula is an exceedingly delicate matter, except in extreme cases of excessive or deficient functioning, we are thrown back upon observation of physical traits, physiological reactions, or psychological ones.

The successful aviator

The military psychologists were interested in the relationship of temperament and success in aviation.

Birley,[1] in his discussion of "Temperament and Service Fighting," concludes that the temperamentally unfit is the physically unstable. Pulse and blood-pressure tests were used to determine the emotionally unstable, since emotional disturbances are readily reflected in the circulatory apparatus. He concludes:

> Lack of resistance to strain appears to be part of the general "make-up" of the individual, and it must be supposed that the lack of inhibition in the higher nervous centres paves the way for a spread of nervous impulses, which give rise to a variety of physical phenomena, characterized by overaction (tachycardia, tachypnœa, sweating, gastric hyperacidity, arterial hypertension, and so on). The practical proof that an individual of this type is unfitted for service flying is supplied by his failure to withstand mental strain of such a degree as to affect the more stable individual only temporarily or not at all, while confirmation of his instability is provided by physical as well as mental examination. Temperamental and physical unfitness are accordingly not separate but closely allied things. . . .

Psychological tests of temperament

The aviation tests showed that it is possible to weed out the emotionally unstable by observation of physiological reactions. Recent developments in fact promise much in the way of standardizing physiological tests of the emotions. Such tests, however, require a great deal of time to give and are not suitable for group testing. Naturally one's attention turns next to the possibility of psychological tests for

[1] "The Medical Problem of Flying." Medical Research Council, *Special Report Series*, No. 58, page 167.

temperamental and emotional traits—the topic to be developed in the following chapter. Such tests not only economize on time but also reveal more kinds of reaction than physiological tests do. Pure types, although very important from the theoretical viewpoint, are relatively infrequent, and, in any case, when working with the individual one is seeking to find out his peculiar combination of traits. Many and varied tests may be needed to find the key to this combination.

CHAPTER TWO

Intelligence Testing and Its Supplementation

Intellect is not a fundamental constituent of the character; it is its light, but not its life, nor, consequently, its action. The character sends its roots down into the unconscious—i. e., into the individual organism: this is what makes it so difficult to penetrate and modify.[1]

Intelligence testing firmly established

BINET, in 1905, proposed to lay a definite mental scale on man and measure his intelligence by an exact standard. A practical analysis of human personality was thus begun, and the foundation of a new science laid which in less than a quarter of a century has almost revolutionized our social thought. Today intelligence testing is a firmly established part of our educational and industrial procedure. Much is yet to be learned concerning tests and the interpretation of results, but it can be said that we have learned to measure in a fairly satisfactory manner one of the factors making up human personality.

Other tests needed to supplement intelligence tests

But all who know human beings realize that after we have measured the intelligence of an individual we are far from having an analysis of his make-up that will enable us to understand his character, to predict his behavior, to decide his fitness for position

[1] Ribot. *The Psychology of the Emotions.*

and power. Before we can make a scientific analysis of human character that will be in any sense complete, intelligence tests must be supplemented by other tests for the measuring of factors other than intelligence in the human personality.

Character tests

Experts in industrial efficiency,[1] mental deficiency,[2] delinquency,[3] and education,[4] all stress the significance of factors other than the intellectual. The real difficulty is to decide what tests are needed and then to devise them.

In practical affairs we all have our methods of gauging the characteristics of others. The way a

[1] "We all know men clearly of secondary ability who nevertheless occupy high positions in business and state. We are acquainted also with men of excellent native endowment who still have never risen above the ranks of mediocrity." (Scott, W. D. *Increasing Human Efficiency in Business.*)

[2] "Temperament undoubtedly plays an important rôle among the feeble-minded, determining to a large extent their social adaptation." (Goddard, H. H. *Psychology of the Normal and Subnormal.*)

[3] "Character force makes for efficiency of personality not less than does intelligence superiority. In fact, of the two, character is the valid determinant of personality behavior; since what is done is more potent than what is planned." (Fernald, Guy. "Character as an Integral Mentality Function," *Mental Hygiene,* Vol. 2.)

"Many of the so-called 'moral imbeciles' are probably able to pass intellectual tests lasting but a few minutes. Like the unstable or inert they are not failures because of a lack of intellectual understanding of right and wrong, but because of excess or deficiency of their instinctive tendencies, especially in the emotional sphere." (Miner, J. B. *Deficiency and Delinquency.*)

[4] "If the elements contributing to a child's success in school are to be adequately understood, not only that child's ability or intelligence but his attitude toward his school work—his industry, his interest, and his deportment—must be taken into account." (Pressey, S. L. "General Intelligence and Character Traits," *Elementary School Journal,* Vol. 21.)

man shakes hands, the manner in which a woman enters a room, seem to us significant.

Practical tests of personality

Gross, in his *Criminal Psychology*, has a paragraph on the topic which I cannot forbear quoting in part. He says:

How a man wears his hat; how a woman eats cheese

> Friedrich Gerstäcker, in one of his most delightful moods, says somewhere that the best characteristicon of a man is how he wears his hat. If he wears it perpendicular, he is honest, pedantic, and boresome. If he wears it tipped slightly, he belongs to the best and most interesting people, is nimble-witted and pleasant. A deeply tipped hat indicates frivolity and obstinate imperious nature. A hat worn on the back of the head signifies improvidence, easiness, conceit, sensuality, and extravagance; the farther back, the more dangerous is the position of the wearer. The man who presses his hat against his temple complains, is melancholy, and in a bad way.

Gross cites also the prudent mother's advice to her son in the selection of a bride—he should observe how a woman eats cheese. "The extravagant one cuts the rind away thick, the miserly one eats the rind, the right one cuts the rind away thin and carefully."

I know a family where the children pass temperament judgments in the following fashion: "When X serves the dessert I want to be served first; when Y does it, last." They are aware that X begins ladling out such generous portions that the last served fare badly; Y, on the contrary, begins meagerly and ends with a substantial portion! All of us make observations on temperamental make-up

when we watch a card game. From shuffle to last trick the player makes unplanned revelations of self.

Matter-of-fact methods

The oldest test on record is probably that of Ulysses, who to avoid going to the Trojan War feigned madness and took to plowing. But when his little son Telemachus was placed in front of the plow, he turned aside and so, it was thought, revealed his sanity! Modern methods are as matter-of-fact. One man in interviewing an applicant for a position is accustomed to seat himself in such a way that the sun shines in his eyes. He wants to see whether the applicant will notice his discomfort and pull down the curtain. This man rates thoughtfulness for others as a business asset. The author has been told of an employment manager who finds occasion to swear at an applicant in order to test the strain that may be put on his temper!

Scientific tests

Let us turn now from life to the laboratory and ask whether it is possible to develop actual scientific tests for different phases of personality.

Measurement by relative position

One method of character study that has been very extensively tried out is that of measurement by relative position. A number of competent judges are asked to arrange a given list of individuals in an order of merit, from first to last, with reference to a personal trait such as aggressiveness or perseverance or leadership or what-not. It is possible from a number of arrangements to determine the average estimate of an individual for any number of traits and to determine also how constant are the judgments

passed upon him by different judges and their degree of reliability.

Statistical methods

This method of "order of merit" was devised by Dr. Cattell and was used by him in a study of the relative eminence of the scientists of the United States. It has also been extensively applied by other investigators, since it afforded the first suggestion of a way by which the "subjective" judgment, in contrast to the "objective" judgment, might be studied. An objective judgment is one whose accuracy may be measured by application of a foot rule or weighing scale to the object judged. The subjective judgment is a personal opinion whose actual value was undeterminable until Cattell worked out the statistics applicable to the situation. It is now possible to show how constant "personal opinions" are and whether they agree with the average judgment of experts.

Perseverance cited by Webb as most general character trait

As an outcome of a very elaborate study of character traits in a group of English schoolboys, carried on by the order-of-merit method, Webb [1] concluded that there exists a general character factor which pervades the whole make-up of an individual. This general trait was named perseverance. Webb puts it on a level with the so-called factor of general intelligence which has been assumed by certain psychologists as a factor distinguishable from specific manifestations of intelligence such as memory and imagination, but functioning in all.

[1] "Character and Intelligence." Monograph III, Supplement III, *British Journal of Psychology*, Vol. 1, 1915.

As a further development of the measurement of character traits by the method of relative positions, rating scales have been devised. The Army Rating Scale—called the Man-Gauge—was organized by Dr. Walter Dill Scott, now president of the Northwestern University. To show how the scale is made and used let us cite the instructions published in the *Psychological Bulletin,* 1918: [1]

The Army Rating Scale

How to make the scale. Make a list of about a dozen officers of your own rank and not above the average age of officers of this rank. They should be men with whom you have served or with whom you are well acquainted. Include officers whose qualifications are poor or mediocre as well as those who are highly efficient.

Look over your list from the viewpoint of physical qualities only. Disregard every characteristic of each officer except the way in which he impresses his men by his physique, bearing, neatness, voice, energy, and endurance. Select that officer who surpasses all others in this qualification and enter his name on the line marked highest under physical qualities. Now select the one who most conspicuously lacks these qualities and enter his name on the line marked lowest. Select the officer who seems about halfway between the two previously selected and who represents about the general average in physical qualities; enter his name on the line marked middle. Select the officer who is halfway between the middle and the highest; enter his name on the line marked high. Select the one who ranks halfway between middle and lowest; enter his name on the line marked low.

[1] "The Army Rating System." *Psychological Bulletin,* 1918. Psychological Review Company, Princeton, N. J.

In the same manner make out scales for each of the other four sections (Intelligence, Leadership, Personal Qualities, and General Value to the Service).

How to Use the Scale. Rate your subordinate for physical qualities first. Consider how he impresses his men by his physique, bearing, neatness, voice, energy, and endurance. Compare him with each of the five officers in Section I of the Rating Scale, and give him the number of points following the name of the officer he most nearly equals. If he falls between two officers in the scale give him a number accordingly (e. g., if between low and middle give him 7, 7½ or 8).

Rate the subordinate in a corresponding manner for each of the other four essential qualifications. Under III (Leadership) and V (General Value to the Service) consider which officer he will most nearly equal *after equivalent experience.*

The total rating for a subordinate is the sum of ratings you give him in the five separate qualities. If directions are followed carefully, the average of any considerable group of officers rated is about sixty points. In other words, sixty points for a lieutenant means that a captain has compared him with the captains he knows and certifies that after equivalent experience he will be equal to an average captain.

Rating scales have multiplied within recent years. They are extensively used in the industrial and educational worlds. By aid of them judgments on personality traits are made with greater accuracy than holds for uncontrolled opinion. There are, however, many points of inadequacy in a rating scale, as appears from Rugg's careful analysis of personnel work in the army. He concludes that the rating

scale did not locate an officer within his "fifth" of the entire scale.[1]

Conspicuous traits

Besides calling attention to the refinements of technique necessary in rating by a scale, Rugg has canvassed other factors which enter into character judgments and reduce their value as objective measures. In particular he has shown the strong tendency of individuals to be governed in their judgment by the general mental attitude toward a given individual and that this general mental attitude may be set by a "conspicuous" trait of the individual concerned. Rugg uses in illustration the "striking case of Captain X."

> "Captain X was so well known and was so conspicuous in his group that he was used by thirteen officers on twenty different subordinate scales—physical qualities, intelligence, leadership, etc. On each of these twenty scales he was elected to be 'the poorest man I ever knew.'" But when these personal opinions were compared with objective measurements, as was possible in the case of intelligence, it was found that Captain X was in intelligence first ranking man among 151 officers. "Moreover, he had been regarded only a few years before as an all-round man, for he was a Rhodes Scholar at Oxford from a middle-western state university. At Oxford he made such a record that he was excused from certain examinations. Here then is a startling example of divergence between ability-to-do and our judgment of it."

Rugg was interested in determining the cause of such a discrepancy and was able to get at it through

[1] "Is the Rating of Human Character Practicable?" *Journal of Educational Psychology*, Vol. 13, 1922.

personal interviews with the judges. Undoubtedly the estimates of Captain X's intelligence had been influenced by his associates' opinion of his personal qualities. "The judges were unanimous in saying that it was impossible to 'live with him.' He was a 'rotter,' or 'yellow,' or a 'knocker' or 'conceited'! The man's personal qualities loomed so large in the process of judging as to play a completely domineering rôle. It is not possible that the judges really 'judged' X's intelligence. They were controlled by a predisposition, a bias, a prejudice. This predisposition was a general mental attitude toward Captain X, dominated primarily by an attitude toward him as a social associate."

The "halo"

Thorndike, also, has called attention to the tendency for all judgments on an individual to be colored by the general feeling toward him, and he has employed the expressive term "halo" to refer to the attitude that an individual inspires.

Rating scales

The main criticism directed against rating scales is the bias of judges and the influence upon them of conspicuous physical and social traits. Another criticism turns upon the failure of experimenters to define exactly the traits that are to be rated and the taking over of terms directly from everyday life, terms which cover a complex of native and acquired qualities rather than fundamentally simple psychological aspects of personality. Social "tact," for example, is certainly a complicated and not a simple matter.

In a number of cases an attempt has been made to

The Porteus Ratings Scale

find out what the basic personality traits are for a particular purpose, although the psychological analysis has not been pushed very far. In establishing his Social Ratings Scale for determination of a social inefficiency index, Porteus [1] has by preliminary experiment established the seven following qualities as fundamental:

(1) Lack of planning capacity
(2) Irresoluteness
(3) Nervousness
(4) Silliness
(5) Suggestibility
(6) Impulsiveness
(7) Moodiness

From scores on these seven traits a total is obtained which constitutes the social inefficiency index. Porteus' scale is expressly adapted for work with the mentally defective, but it is included in this discussion because of the way in which it was developed and the author's clear-cut recognition of the need of character testing in addition to intelligence testing. In fact, the maze tests which bear his name were put forward by Porteus as a series of tests which reveal forethought and planning capacity, prudence and mental alertness in meeting a new situation, characteristics for social success which are not tested by the Binet.

Why not entrust personality rating to the individual

[1] *A Study of Personality of Defectives with a Social Ratings Scale.* Publication of Training School, Vineland, New Jersey, No. 23, 1920.

concerned? Most of us are convinced that we know considerably more about ourselves than our neighbors do! Self-rating on a rating scale has, in fact, been tried out. It enables us to compare an individual's estimate of himself with the estimates of his associates. Hollingworth reports a general tendency for an individual to overrate himself in qualities that are socially valuable and to underrate himself for the contrasting qualities. Allport suggests establishing a conceit index by a quantitative determination of the extent to which an individual's self-rating varies in either direction from the average rating by a number of other judges.

How reliable is a Self-Rating?

Insight into self—or lack of it—has very great practical significance. This is recognized in psychopathology and in reform work with criminals. The mentally sick and the morally sick who can achieve insight into their condition are on the road to recovery. A method of measuring self-insight would be most valuable. Where objective measures of any particular trait are at hand, as is the case for intelligence, it is quite possible to work out the self-evaluation index for a man, according to Allport and Allport's instructions, "by the difference between his actual rank in the group in the intelligence test score and his self-ranking, prefixing a plus or minus according to whether he over or underrated himself."

Self-evaluation of practical value

Allport and Allport cite the following from the Harvard Laboratory: "There is a striking tendency for those who are high in intelligence to have a negative index, that is, to underestimate themselves, and

for those who are low in intelligence to have a high index." [1]

Scientists rate themselves with considerable accuracy

Cattell in his investigation of the thousand most eminent scientists in the United States [2] found evidence of considerable accuracy in self-evaluation. He concludes, "We can judge ourselves slightly more accurately than we are likely to be judged by one of our colleagues." It is possible that the excellent self-insight possessed by Cattell's scientists was due to superior intelligence and capacity for personal detachment.

Establishment of objective tests for various personality traits will make possible not only a self-evaluation index but also a social evaluation index, since in case of striking discrepancies between the objective test of a certain trait and the social evaluation of it, it will be possible to locate the cause of discrepancy either in the bias of a given group of judges or in society as a whole. The possibility of turning social psychology into an experimental science is very promising from this angle.

Personality produces a social reaction

Personality study must certainly include an investigation of individuals considered as stimuli for social reactions. What a man seems to be may, for social purposes, be quite as significant as what he measures up to by actual application of a foot rule. Even the discredited systems of character analysis

[1] "Personality Traits: Their Classification and Measurement." *Journal of Abnormal Psychology and Social Psychology*, Vol. 16, 1921.

[2] *American Men of Science*, 1910.

through shape of head, facial characteristics, and the like, influence the judgments passed upon a man by his associates. Gowin, in *The Executive and His Control of Men*, cited figures to prove that, on the average, the executive exceeds in height and weight his subordinates. He attributed this in part to the superior energy and endurance that accompany superior size but in part to the increased social prestige that impressive size confers. The applied psychology of personality will need to consider how various personality types affect different social groups. Perrin [1] has made an interesting beginning in investigating "Physical Attractiveness and Repulsiveness" as factors in college popularity. One item of the report may be given here: "Any feature, if it conforms to the mode, tends to elicit a favorable reaction of median strength; but if it departs from the mode, it tends to arouse an unfavorable reaction of greater relative strength." This means that, other things being equal, we find conformity to the average an item in physical attractiveness. The giant and the dwarf and the excessively fat or excessively thin individual arouse fear or amusement or a feeling of superiority in the beholder. It would be valuable to know how far this same principle operates in temperamental traits. It seems quite likely that it holds true for intelligence. The precociously clever child is apt to be an object of suspicion to his mates even though he maintain a perfectly normal attitude toward himself. Perhaps it is only when society

Size

Physical traits influence popularity

[1] *Journal of Experimental Psychology*, Vol. 4, 1921.

realizes the value accruing to itself from the presence of an original genius that it forgives his departure from the "mean" or average. Even Nature apparently tips the balance in favor of the survival of the "mean," although not—as the newspaper reporter got it—survival of the "meanest"!

Photographs

In determination of the effect on social judgment of different types of faces, photographs may be used. Some interesting experiments have already been tried that bear more or less directly upon this. It is fairly evident from Hollingworth's report [1] that the judgments on photographs passed by groups of individuals for such traits as intelligence, perseverance, kindliness, and the like, are somewhat consistent, but that single judgments taken at random do not check up well with judgments gained from actual acquaintance with people. Pintner,[2] by asking for judgments on the intelligence of photographed children, was able to compare the rankings obtained from trained medical men and psychologists with the results of actual tests. He found some mentally inferior children placed high and some superior children placed low in a group that ranged from very superior intelligence to feeble-mindedness. The author has collected some interesting material on the effect upon character judgments of certain facial characteristics. When a series of portraits of famous but unrecognized

[1] *Vocational Psychology.*

[2] "Intelligence as Estimated from Photographs." *Psychological Review,* Vol. 25, 1918.

philosophers and good-looking but commonplace pedagogues are arranged in an order of merit for intelligence, the commonplace man frequently outranks the great one. Condillac, great psychologist, and Comte, great philosopher, fall quite at the end of the group in the average judgment by psychology students. By the use of photographs it should be possible to get some notion of the popular conceptions that bias social judgment. It may also be discovered that photographs may be used to pick out individuals who actually are keen in sizing up a man by his looks or in interpreting emotions from facial expression.

Fernald's Ethical Discrimination Test

Dr. Fernald has utilized order-of-merit arrangements to find out how delinquents react toward social problems. Such subjects are given ten printed cards, each containing a description of an act that violates the moral code. They are told to "arrange these offenses in a series from least to greatest in the order of their gravity." Among the offenses cited are the following: to take a cent from a blind man's cup; to take two or three apples from another man's orchard; to take money as "graft" or "rake-off" when you are a city or government official; to break into a building to rob it. Obliquity in moral judgment is revealed by too great departures from the average judgment of the normal adult.

Psychoanalysis

A method of general psychology that has been utilized in an attempt to snapshot character or temperamental traits is the association method. In medical psychology this method—under the name of

psychoanalysis—is employed as a means of unveiling emotional complexes or the organization of ideas around disturbing emotions.

In a free association test the examiner asks his subject to pronounce the first word that comes into his mind after hearing another word spoken. A list of words is presented serially, and both the time taken to give an association and the kind of association given are studied in an attempt to understand the subject's make-up. Words arousing emotions block association and lengthen the time of reaction, or may lead to a complete break in thought.

Moore's test for strength of instincts

Moore [1] proposed to use a form of association test in measuring instincts, since the instincts dominating an individual color his personality strongly. A pugnacious individual obviously differs in very grain from a timid one. Dr. Moore gave his subjects series of words strongly suggestive of certain types of instinctive situations, assuming that in proportion as the instinct is one frequently and vividly experienced by him the more quickly and uniformly the subject would respond with an appropriate verb.

To illustrate: "If one of the pugnacity stimuli, such as 'enemy,' 'insult,' or 'attack,' is given, a subject by nature very pugnacious may be expected to react with considerable speed, and with a verb-form indicative of resentment or attack. If one of the self-assertion stimuli is offered, such as 'career,' 'success,'' or 'achievement,' a self-assertive individual

[1] "Testing the Strength of Instincts." *American Journal of Psychology*, Vol. 27.

may be expected to reply quickly and with such expressions as 'strive,' 'struggle,' 'attain.' "

Marston's investigation of deception: the efficient and inefficient liar

Marston,[1] in an investigation of "Reaction Time Symptoms of Deception," has also made use of the associated with it, and the examinees are asked to of behavior during deception. The first or positive type is that of the unsuccessful liar whose departure from truth is evidenced not only by flushing and other signs of embarrassment but also by his retarded reactions to critical words in the association test. The emotion of fear blocks the smooth running of the nervous mechanism.

The second or negative type is that of the gifted liar who by sheer power of concentration of attention upon the end in mind is able to avoid giving the usual signs of guilt. He usually concentrates too intensely and may reveal his deception by a shortened time of reaction to the critical words. Marston found also the mixed type, subjects who under good physical conditions were able to deceive but who lost control of themselves on their "off days."

The revelation of the "lying complex" by the association test would seem dependent upon the fact that the difference between the successful and unsuccessful liar is largely a matter of the degree to which attention can be steadily focused. It is quite probable that a careful survey of attention types would suggest tests that would be of value in personality study. The following contrasting types of attention are worth noting: attention may be broad or narrow

[1] *Journal of Experimental Psychology*, Vol. 3. 1920.

in span, quick or slow in adjustment; fixating or fluctuating; uniform or labile, and this quite apart from degree of intelligence. It has been suggested that the broad-span type of attention excels for practical life and the narrow or intensive type for academic life, although exceptions have been noted.

Pressey's Group Test of the Emotions

Association tests as usually carried out require considerable time. Dr. Pressey [1] has overcome this difficulty by devising a method for giving an association test to a large group at once. The stimulus word is presented with a number of others frequently associated with it, and the examinees are asked to cross out words according to very definite instructions. For example, the examinee is instructed to read through twenty-five lists of words and to "cross out everything about which you have ever worried or felt nervous, or which you have ever dreaded." By careful selection of words Pressey feels that he is able to uncover such dominant trends in personality as self-consciousness, fear, preoccupation with sex, suspiciousness, and the like.

Myerson Unfinished-Story Test

A somewhat different way of getting at personality has been suggested by Myerson.[2] Myerson gives his subject an unfinished story and allows him to choose from a group of completions the ending he prefers.

[1] "A Group Scale for Investigating the Emotions." *Journal of Abnormal Psychology and Social Psychology*, Vol. 16, 1921.

[2] "Personality Tests Involving the Principle of Multiple Choice." *Archives of Neurology and Psychiatry*, Vol. 1, 1919.

One story runs as follows:

Card	Slips
	Will miss a lot of fun.
1. The man who lives a pure life	Will gain the respect of all.
2.	Treads a difficult path.
	Will be cheated by rogues.
	He will regret untasted pleasures.
	He will be serene and wise.
3. As he reaches old age .	He will still meet with temptation.
4.	His children will want bread.
	His memory will be honored.
	His struggles will be ended.
5. After he is gone . . .	He will be a long time dead.
6.	He will fill a pauper's grave.

Four stories (or mixed versions of them) may be worked out. These stories may be classified as the conventional, the naturalistic, the cynical or humorous, and the pessimistic. The typical conventional optimistic story runs thus:

1. The man who lives a pure life
2. Will gain the respect of all.
3. As he reaches old age
4. He will be serene and wise.
5. After he is gone
6. His memory will be honored.

The other versions the reader will enjoy finding for himself.

Watts'[1] tests of the "Optional Question" in principle resembles the multiple-choice test of Myerson.

A very different type of test is Fernald's Achieve-

[1] "The Outlook for Vocational Psychology." *British Journal of Psychology*, Vol. ll, pages 194–205, 1921.

Fernald's Endurance Test

ment Capacity Test,[1] designed to measure will, persistency, determination, or pluck, a trait which Fernald says can be measured in terms of voluntary endurance of discomfort or pain. In the test arranged by Fernald the subject stands with his heels one fourth of an inch off the floor. A simple apparatus is arranged to record the degree of elevation of the subject's heels while being tested. By means of this device the subject is warned if ever there is a tendency to lower his heels. He is asked to show his will power by keeping his heels off the floor even when very tired. "Now take all the time you want and if your record is a good one it will show how well you can make good even when tired. This test is to show me and show you whether you are a quitter or a stayer."

The score is the time the subject keeps his heels elevated. The average time for maintaining such elevation is about fifty minutes among normal subjects, with a range from twelve minutes to two and one-half hours. Delinquents show much less endurance; their range is from less than four minutes to less than fifty-two minutes. Fernald's conclusion is that the test really reveals a difference in will power between normal and delinquent individuals. Moore and Gilliland have also a measurement of aggressiveness which will be discussed later.

Temperamental traits revealed on the witness stand

The application of psychology to legal problems has instigated study of human testimony. It is important to know how accurately a given witness is

[1] *The Defective Delinquent Class: Differentiating Tests.*

capable of testifying, how many items he will include in his report, and how far he will be confused and misled by a cross-examination. The degree of confidence with which a witness reports a fact and his readiness to take an oath as to the accuracy of his account are also important. Most of us have made observation on such matters when attending court trials and watching the man or woman on the witness stand. We have noted the hesitant nervous man averse to swearing to the simplest item and the assured individual who is ready to take his oath that his testimony is 100 per cent reliable. It is obvious that the witness is not only giving an exhibit of the quality and range of his observation and memory but also of such temperamental qualities as self-confidence, emotional stability, suggestibility, and the like.

Testimony tests

Testimony tests have been standardized. Whipple has given a number of formulas for determining the most important coefficients of report. The ratio between the number of items reported with certainty (including attestation) and the whole number reported is a measure of assurance. The reliability of the witness's assurance is determined by the ratio of items correctly reported to those reported with certainty. The tendency to oath, or attestable assurance, is measured by the relative number of items whose correctness is attested under oath to the whole number of items reported.

The possibilities inherent in the testimony test for study of temperamental and character traits have probably never been fully appreciated. It has been

said that the degree of readiness with which a man commit themselves to the full, even when there are decisiveness in situations where there is a general tendency to hesitate. Very cautious persons rarely commit themselves to the full, even when there are good grounds for having decisive opinions. Men of little reliability commit themselves too freely in the absence of valid reasons. Traits such as these obviously bear upon a person's qualifications for holding responsible positions. Tests of suggestibility have been tied up with work on testimony. We will consider them later in connection with one item of the will-temperament test.

The search for specific personality tests is a valuable piece of work. Possibly our greatest need is for a battery of personality tests from which may be chosen those most suitable for a particular purpose. Gradually, by a method of trial and error, tests will accumulate which may later be assembled in a series. There is, however, a different method of procedure—the starting, for example, from some theoretical angle, such as one of those outlined in the preceding chapter, and endeavoring to work out a series of tests for one phase of personality. This is the line of attack in the present book. The general activity or dynamic level of personality is tested out.

Allport and Allport have made a systematic study of personality

Allport and Allport, in their valuable investigation of "Personality Traits: Their Classification and Measurement," [1] have also sought to develop tests

[1] *Journal of Abnormal Psychology and Social Psychology*, Vol. 16, 1921.

that bear upon a particular conception of personality.

Personality is here conceived as the "adjustment of the individual to his social environment," and specific tests are sought for the main constituents of personality, which are organized in a scheme used in the Harvard Psychological Laboratory as follows:

PERSONALITY

I. Intelligence.
II. Temperament.
  1. Emotional Breadth.
  2. Emotional Strength.
III. Self-Expression (Strength).
  3. Extroversion-Introversion.
  4. Ascendance-Submission.
  5. Expansion-Reclusion.
  6. Compensation.
  7. Insight or Self-Evaluation.
IV. Sociality.
  8. Social Participation.
  9. Self-seeking and Aggressive Self-Seeking.
  10. Susceptibility to Social Stimuli.

The third group of traits gives us an experimental treatment of aspects of personality outlined in the preceding chapter. Extroversion-Introversion marks the distinction in attitude between individuals whose images, thoughts, and problems find ready expression in overt behavior and those who live largely in a realm of imagination creating inwardly a more desirable ideal world rather than adjusting to an outwardly real one. The terms Ascendance-Submission point the difference between those who

dominate their fellows in a social relationship and those who submit. The extent to which one's "ego" enters into all one says or does, or, on the contrary, is kept in the background, is covered by Expansion-Reclusion. By compensation the writers refer to the tendency to "compensate" for any form of inferiority—physical, mental, social, or financial. The degree to which an individual is able to appraise correctly his own personality traits is termed Insight or Self-Evaluation. In scoring individuals on these traits, the writers use the rating of individuals by their associates, have recourse to a questionnaire put in behavioristic terms for self-rating purposes, and try out objective tests.

To test ascendance-submission an active-passive reaction study was devised. Situations were put up to the individual in the following manner: "Upon leaving college you become a salesman and are trying to sell a life-insurance policy to a middle-aged financier of great note. He says: 'Young man, I don't know how long you have been in the game, but you will never succeed unless you acquire more experience and confidence in yourself!' What will you say or do?"

As a test of expansion-reclusion the subjects were asked to write a letter answering an advertisement of a position. Here the expansive individuals indulged freely in self-reference, while the reclusive gave brief, meager accounts of themselves. A motor expression test was also found serviceable for this trait.

Insight and self-evaluation or correct self-appraisement of personality traits was determined by the average variation of an individual's self-rating from the average estimation of him by three qualified raters, and by his capacity to judge his general intelligence as compared with some objective measurement of intelligence.

Susceptibility to social stimuli was measured by the ability to read emotional expression from photographs.

Graphs are plotted to exhibit a picture of the personalities tested. They are accompanied by valuable case studies of the individuals portrayed.

Voelker tests for trustworthiness

Some very specific tests for trustworthiness have been developed by Voelker.[1] The series was planned to cover the following situations:

1. The Overstatement Test. Can the subject be trusted to refuse credit that is not due him?
2. The M and N Test of Suggestibility. Can the subject be trusted to stick to a point when he knows he is right?
3. Let-Me-Help-You Test. Can the subject be trusted to refuse help in the solution of a puzzle when he has been instructed to try to solve it independently?
4. Borrowing Errand Test. Can the subject be trusted to return borrowed property according to promise?
5. Purchasing Errand Test. Can the subject be trusted not to accept overchange?
6. The Tip Test. Can the subject be trusted not to accept a tip for a trifling courtesy?
7. The Push-Button Test. Can a subject be trusted to do a given task exactly as it was given to him to do?

[1] "The Function of Ideals and Attitudes in Social Education." *Teachers College Contributions to Education*, No. 112, 1921.

8. "A" Test. Can a subject be trusted to work faithfully at an assigned task when there are other interests to distract him?

9. The Profile Test. Can the subject be trusted not to peep when he is placed on his honor to keep his eyes closed?

10. The Tracing and Opposites Test. Can the subject be trusted not to cheat in an examination?

The foregoing survey makes it very evident that tests for character and temperament are multiplying. It can be only a question of time until we are supplied with those we need for practical purposes.

CHAPTER THREE

Experimental Prospecting

SCIENTIFIC thinkers have frequently stated that muscular movements and their inhibitions reveal temperament—fundamental traits of human personality—and that an analysis of certain factors in the human make-up can be made from a study of movement. In everyday life we all judge character from action.

Movement should be studied in character analysis

None of the tests reviewed in the preceding chapter made any attempt to measure this aspect of individuality, and yet it would seem that here we find a phase of personality which might color all its other manifestations, whether intellectual, instinctive, or emotional.

Muscle-reading and handwriting

The author's approach to the will-temperament test involved considerable preliminary experimentation. Two lines of investigation were followed: (1) An attempt to determine whether muscle-reading could be developed into a scientific method for study of individuality; and (2) an investigation of the degree to which personality could be determined from exercises in handwriting.

A word is in order concerning both types of investigation.

One of the most interesting demonstrations of

Mind-reading is muscle-reading

the motor consequences of an idea is found in the common vaudeville stunt known as mind-reading, but which is more correctly termed muscle-reading. In such performances the mind-reader attempts to discover the place where an object is hidden by touching the hand or shoulder or forehead of some one who knows where it is and who by his unconscious movements guides the mind-reader to it. The information the trained muscle-reader may get from the guide, through contact, is truly amazing. It is quite possible to guess the number of which a person is thinking, or to identify a particular ace in a deck of playing cards, or to locate one word in a volume of several hundred pages, or to find a pin in a big building.

"Calculating horses"

Frequently, in vaudeville, a horse is substituted for the human mind-reader. Instead of locating hidden objects through touch, these horses demonstrate their mathematical powers by beating out with the hoof numerical answers to difficult problems. A very extensive set of experiments was carried out on the famous calculating horse of Berlin, known as Clever Hans. It was found that Hans was *not* a mathematical shark; he was only amazingly clever in responding to delicate signals given unconsciously by any man who propounded a problem to him. One involuntary signal started Hans to tapping with the hoof; another signal stopped the tapping. The examiner knew, of course, the number of taps necessary for the correct answer to the problem in addition or multiplication or square root that he had given Hans, but the tiny jerk of the head by which he signaled that it

was time for the tapping to stop was wholly involuntary. Often this head-jerk was less than one sixteenth of an inch in extent.

That Hans was really a mind-reader was thought demonstrated by the fact that it was not necessary that the problem he was to solve be given him aloud! It could be written on a blackboard out of his sight! Or put to him mentally!

Human beings respond to signals given unconsciously

However, when in the laboratory a human being "played the horse" it was possible to prove unmistakably that he was actually responding to unconscious signals on the part of the silent questioner, for the latter's tiny head-movements that served as signals were registered by attaching to his head a pencil that wrote on a smoked drum.

In the author's own laboratory a series of experiments is now under way, in which the mind-reader gets his signal for recognition of the number of which a companion is thinking from the delicate dilation of the pupil of the eye which is a reflex movement absolutely outside of conscious control. Salesmen have been advised to watch for this dilation as a sign that the psychological moment has arrived for getting the prospect's signature on the dotted line!

Some men reveal their thoughts more completely than others

The work with calculating horses had scientific value not only because it showed the expertness of the horse in responding to human movements; it also demonstrated the extent to which man reveals his thoughts, his decisions, his emotions, through involuntary movements, and it proved that individuals vary widely in the degree to which "they give themselves

away." The horse responded most successfully to individuals who showed lapse of self-control under conditions of intense concentration; those in whom there was a readiness of motor discharge; those, in short, otherwise reputed to be very impulsive and possessed of "temperament."

Mind-reading as achieved by equine performers is a matter of interpretation of visual signals; the human artist usually has recourse to reading involuntary movements through touch, as stated in an earlier paragraph.

Shifts in muscular tension show the direction of attention

The author has carried out elaborate experimentation on this method of mind-reading, in which she herself or a trained assistant has interpreted the delicate shifts in muscular tension by which the guide registers every change in focus of attention, every vacillation in judgment.[1]

To quote from a previous report by the author: "It is difficult to comprehend without first-hand experience the wonderful accuracy of the operator's response to the slightest variation in the guide's muscular tension." H., for example, has placed a clock on a ledge above a very wide table which is flat against the wall. This clock is to be found by D., the blindfolded operator, who touches H. lightly on the wrist. D. walks to the table, following the delicate twitching of H.'s muscles. At this point H. begins to chuckle mentally, thinking, "She can never reach the clock." D. raises herself on tiptoe and leans over

[1] "Muscle-Reading: A Method of Investigating Involuntary Movements and Mental Types." *Psychological Review*, Vol. 16.

the table, exclaiming, "I can't reach it!" H. has a mental picture of D. climbing on the table. D. then pulls herself over the table and finds the clock.

The operator gets a unique acquaintance with the guide's mental processes, such as his uncertainty, his timidity, the course of his deliberations. In the investigation under consideration, interest centered in determining the individual characteristics of different types of guide. It was discovered that it was a rare individual indeed whose muscles could not be read, but that one's method of procedure must be varied to meet individual temperaments. The guides easy to handle are those who in daily life exhibit few obstructions either in judgment or action, who are suggestible, impulsive, and given to automatic or unconscious movements. It is this type the platform demonstrator succeeds in enticing to the front when he calls for volunteers to assist him. The one point of difficulty is that he may draw in this group a scatter-brained individual who is unable to concentrate for more than a few seconds on the object he is to think of, or one whose tension is so extreme that he gives premature signals; that is, he relaxes too soon when the search is on.

The "impulsive" person the best guide in muscle-reading

The contrasting guides include individuals who are more hesitant in action and in judgment, who are critical and reserved and so aware of all their movements that they can hold them under control. Frequently, however, they concentrate their attention very rigidly and give very accurate, if very slight, muscular signals.

Temperament determined by readiness of motor discharge

Temperament appears to be very largely determined by the readiness with which the motor discharge, which initiates movement, occurs in the nervous system and the degree to which it stimulates consciousness. Not always, however, is the nervous energy which is released drained off by involuntary or voluntary movement. In some cases it expends itself in causing changes in glandular secretions, which in turn influence temperament.

Baffling the guide

Varying impulsiveness and varying capacity for inhibition of involuntary movements are not the only individual characteristics revealed by muscle-reading. It is possible to study all sorts of temperamental reactions by variation in experimental conditions. For example, the guide may be asked to hide an object. He is then blindfolded and contact established with the muscle-reader, who is also blindfolded. Meanwhile, a third individual sees to it that the pathway which leads to the object is blocked. The guide's expectations are thus baffled! When it proves impossible to move on, very characteristic reactions appear. Some guides show their bewilderment by delicate fluttering movements; others resort to wild exploration; others maintain an ironlike muscular tension, a refusal to give in, an insistent demand that the operator move on in spite of every obstacle!

It was this particular experiment in muscle-reading that suggested the test for resistance to opposition included in the will-temperament tests and later described at length.

But muscle-reading, although extraordinarly sug-

gestive in its outcome, is not adapted to general testing, for the following reason: It depends too much for its success upon the skill of the operator, or muscle-reader. In case of failure in a particular test one does not know whether to attribute it to the latter's expertness or to the guide's temperamental make-up.

Muscle-reading not scientifically exact

It would, of course, be possible to substitute apparatus for the operator's hand and to register by this means the guide's involuntary movements. This has, in fact, been done in many laboratory experiments. But the use of delicate apparatus is not practicable in rapid and extensive testing. Moreover, it may interfere with natural responses.

Involuntary movements registered by laboratory devices

The author's next departure concerned itself with the use of handwriting exercises in revelation of temperamental differences. The transition from muscle-reading to investigation of handwriting was a natural one to make, since in connection with muscle-reading it had been discovered that a very easy way to select a particularly good guide was to have him write for a short period while counting aloud, doing mental arithmetic, or in some other way keeping his attention off the writing. If he carried on the double process easily, and if, in addition, he wrote more rapidly under distraction than he did usually and enlarged his writing in size, he was pretty sure to be an excellent guide in muscle-reading.

Automatic writers good guides for muscle-reading

Writing under distraction of attention throws into the foreground, in fact, the same contrasting temperaments that muscle-reading does: (1) the explosive

Writing under distraction

suggestible individual who easily lets go of muscular control and produces involuntary automatic movements; and (2) the highly controlled individual who surrenders conscious guidance with great reluctance and shows this in the writing experiment by producing either a greatly retarded hand or else one excessively reduced in size. For tapping this particular trait of degree of motor-impulsion handwriting under distraction suggested itself as an appropriate test, and one whose outcome could be graded in terms of increased speed and size of writing, as will be shown later.

It seemed possible that handwriting exercises might be used to test other temperamental traits. Many handwriting experts believe that from a person's writing they can tell much about his character. For example, among graphologists it is commonly stated that a small hand indicates love of detail, and heavy, forceful strokes, a strong will; that slanting upward at the end of a line shows an optimistic temperament, and that running downhill is a sign of the pessimist. The writer became interested in these attempts to interpret personality from the handwriting, and instituted a series of researches to determine whether they held any measure of correctness. For the results of these investigations the reader is referred to the full report of them.[1] Here it can only be said that in the main the beliefs of the graphologists were not con-

[1] Downey's *Graphology and the Psychology of Handwriting.* Warwick & York, Baltimore, 1919.

firmed, but some of their ideas were in part found to be correct.

Such possibility as there exists of reading character from handwriting is due to the appearance in handwriting of the signs of the free release of the motor impulses that produce writing or the reverse. In other words, it is possible to identify in handwriting signs of motor explosiveness and motor inhibition.

Signs of motor explosiveness and inhibition in handwriting

These signs were identified by the author through two distinct lines of experimentation:

(1) The production of automatic writing; and

(2) The determination of the characteristics of handwriting that is deliberately disguised.

Samples of automatic writing were obtained for study by a long period of training in which the persons concerned learned how to write automatically a memorized verse while the attention was concentrated on reading a story aloud or silently.[1] It was found that the automatic hand was a large, light, continuous hand slanted toward the right, with, frequently, superfluous strokes or random movements. It gave evidence of hyperkinetic tendencies.

Automatic writing an explosive-hand

When conditions were reversed and attention was definitely concentrated upon handwriting in the endeavor to produce a disguised hand or one completely unlike one's usual hand, very different characteristics appeared.[2] A disguised hand shows evidences of

Disguised writing an inhibited hand

[1] Downey and Anderson, "Automatic Writing." *American Journal of Psychology*, Vol. 26, 1915.

[2] "Handwriting Disguise." *Journal of Applied Psychology*, Vol. 1, 1917.

excessive control and inhibition. It is a small, heavy, cramped, broken hand, with a tendency toward vertical or back-slant. It may also exhibit artificial ornamentation and bizarre curlicues.

In the ordinary writing it is possible to see manifestations of the free or obstructed release of writing movements such as are exaggerated in automatic and disguised writing, and on the basis of these signs it is possible for an expert to draw conservative conclusions concerning the penman's general characteristics.

Writing exercises excellent device for securing characteristic reactions

The interesting thing in this connection was the confirmation of the author's previous conclusion that differences in constitutional motor make-up are mirrored in activity.

It appeared also that handwriting exercises would be an excellent way of recording the acts of individuals when confronted with certain situations, because writing is a muscular movement that leaves behind it a permanent record, and nearly every one knows how to write.

It should, however, be most emphatically stated that in the use of handwriting for this purpose little account is taken of the kind of hand a person writes and no use at all is made of the assumptions of graphologists.

CHAPTER FOUR

The Central Idea of the Will-Temperament

TEMPERAMENT, it appears, reveals itself in various patterned forms of activity. These patterns are determined by:

(1) The amount of nervous energy at the disposal of the individual; and

(2) The tendency of such nervous energy to discharge immediately into the motor areas that innervate the muscles and glands; or, on the contrary, to find a way out by a roundabout pathway of discharge.

Temperament ranges from explosive to inhibited

Hyperkinetic or explosive discharge tendencies in a given individual result from a high level of activity or from great simplification of pathways in the nervous system (absence of inhibition). Hypokinetic or inhibitive trends result from a low level of activity or from undue elaboration of impulses in the brain centers. Temperaments range from one extreme to the other. Since the organism is a unit, the output of energy and its discharge by a simplified or elaborated pathway color the personality throughout.

If, then, it is possible to devise a set of tests for determining the general level of activity or impulsion, the degree of inhibition, and the modes in which impulsion and inhibition function in an individual, we should have a valuable index to the way in which his

intelligence and instinctive equipment would seek expression. Such tests of the energy output would necessarily involve use of some form of mental or motor activity. The will-temperament tests employ, in the main, exercises in handwriting, which will be described later.

Will-temperament defined

At this point a word of explanation should be given concerning the choice of the term "will-temperament" for the aspect of personality we are testing. The word "temperament" is used to refer to an innate, relatively permanent disposition. The word "will" is prefixed to it to indicate the nature of the particular disposition that is tested. This limitation in meaning of the term "temperament" is necessary in order to avoid a possible misunderstanding; namely, the notion that the test is concerned with emotional reactions. By "will," however, no mysterious power is to be understood; it refers merely to the dynamic pattern of the individual. The will-temperament test, since it taps chiefly innate tendencies, is only in part to be conceived as a character test.

Character defined

Character may be thought of as the organization of native and acquired traits affected through inner subjective factors and outer objective ones. Character, in this sense, will be influenced by intelligence or by power to reflect upon and discover the significance of experiences and by the capacity to form ideals; it will also be determined by sensitiveness to social control; and it will be modified by external pressure and by the acquisition of specific habits through pressure of the environment.

Character is not, then, a sum-total of native tendencies: it is a product built upon these tendencies; it is the *direction* in which native tendencies are turned. It follows that *character* is not subject to measurement through tests in precisely the same way as native tendencies are, although one may take a cross section of it at any particular moment.

The will-temperament determines the form assumed by character, although it does not determine its content.

Will-temperament determines the use that is made of intelligence

Similarly, the will-temperament determines the *use* that will be made of general intelligence, although it does not determine the degree of intelligence. Explosive tendencies which may speed an individual of great ability on to success may ruin a less intelligent man. Inhibitions may nullify genius; they may protect a moron.[1]

[1] With increasing interest in personality as a field for scientific investigation, more and more attention is being given to definition of its various aspects. In time a technical vocabulary will develop as a by-product of experimental work. Meanwhile each investigator will do well to define his own use of terms, and this the author has sought to do in the above chapter.

An excellent summary of various conceptions will be found in Allport's review on "Personality and Character" in the *Psychological Bulletin* for 1921. Filter has contributed a valuable analysis in his article on "A Practical Definition of Character" in the *Psychological Review* for July, 1922. He believes that "Character" will come to cover about the traits of the will-profile. To quote: "In fact, the list of traits included in the Downey scale serves as a concrete illustration of the scope of the new definition, with possibly but a few omissions."

And again: "The emphasis is upon the force of activity rather than upon its direction, upon the quality of behavior in terms of strength, persistence, readiness, rapidity, etc., rather than upon its value as right or wrong, good or bad, wise or foolish, etc."

CHAPTER FIVE

The Will-Temperament Tests

The output of energy

AUTHORITIES on human nature have, as we have seen, frequently stressed the level of activity or the energy output as a fundamental phase of personality. James did this in his description of the varieties of the explosive and of the obstructed wills; and Davenport did a somewhat similar thing in his account of the hyperkinetic, or overactive, and of the hypokinetic, or underactive, temperaments.

In an experimental test, the general level of activity and its mode of functioning might be determined in a variety of ways. After deciding upon the features in the activity pattern which seem most significant in the analysis of individual differences, the investigator could utilize a number of different types of reaction in order to throw these features into the foreground for study.

Speed, force, and carefulness of reaction

The phases of the dynamic pattern that seem most essential to the author include: (1) those of speed and fluidity of reaction; (2) those of forcefulness and decisiveness of reaction; (3) those of carefulness and persistence of reaction.

Three groups of tests

Tests of these three phases of activity give us three groups of tests that may be briefly described

as speed-tests, tests for aggressiveness, and tests of carefulness and persistence.

The first group includes four specific tests:

Speed of Movement
Freedom from Load
Flexibility
Speed of Decision

The second group is composed of tests for:

Motor Impulsion
Reaction to Contradiction
Resistance to Opposition
Finality of Judgment

Tests for the four following traits make up the third group:

Motor Inhibition
Interest in Detail
Coördination of Impulses
Volitional Perseveration

In general, writing reactions are used

All but three of the tests represent writing reactions. The reasons for the inclusion of each separate item of the will-temperament test will be given in the proper place. In this chapter only a general description of the test as a whole will be attempted.

The will-temperament tests are published in form suitable for testing each individual separately and

Two forms of the will-temperament test: (1) individual; (2) group test

a form adapted for group testing, with an examiner's manual containing directions for giving and scoring the tests accompanying each form. Any one wishing to read the remainder of this book intelligently must familiarize himself with the individual test at least and with the manual that goes with it. The tests and material in the manuals are omitted from this volume in order that the number of pages may not be unnecessarily increased.

The individual test is recommended for work in hospitals, vocational bureaus, and educational systems where there are time and opportunity for study of each individual. The discussions in this book are based mainly on individual testing. The group tests are an adaptation of these for group work. In the individual test the scoring is done on the basis of the time required for completion of a particular bit of work. The group tests are scored from the amount of work done in a given time. Tests that do not lend themselves to a wholly quantitative treatment are scaled qualitatively. All items of the test are scored on a scale of ten.

Group will-temperament test more difficult to give than group intelligence test

A few modifications of tests that were necessary in giving the group form of the will-temperament test will be commented on in the following chapters. As a whole it was found that the giving of the temperamental group test makes more demand upon the personality of the examiner than does a group test of intelligence. In order to insure speeding or retardation of movement to the highest degree, a stimulus must be found in the examiner's voice and manner.

The goal is a somewhat subjective one, the *establishment of a mental set.* (See page 73.) There operates also in group testing for temperament a social influence which is more noticeable than in intelligence testing. This social influence was particularly evident in tests demanding speeding and retardation of movement and operated most strongly on the suggestible subjects.

A short digression at this point on group testing in general will make plain the author's position concerning the group will-temperament test.

Group testing more valuable in classification than in diagnosis

The advantages of group intelligence testing are now thoroughly recognized—and so are its limitations. Its main value lies in the ease with which it is possible by means of it to classify individuals [1] for practical purposes. It does not lend itself to accurate diagnosis, but it does select out those individuals who need an individual examination for intelligence. Superior and inferior performances may be spotted even though the results of a group test are not adequate for ranking those individuals who are in the central part of the group. Moreover, group testing makes retesting such a simple matter that failures to score that are due to temporary difficulties may be checked out by a second or a third trial.

Social factors operating in group testing

Other uses of group intelligence testing remain to be explored. For one thing, there are children

[1] See Geyer, Denton L., "The Reliability of Rankings by Group Intelligence Tests." *Journal of Educational Psychology*, Vol. 13, 1922.

who do better on the group than on the individual test, or the reverse. This may be explained by the fact that the group test minimizes self-consciousness, and that the group test brings pressure to bear in the form of stimulation furnished by the presence of other individuals all working busily, while in the individual examination social stimulation is furnished by the concentration of the examiner's attention upon the examinee. Children react differently to such social cues, and comparison of their group and individual examinations should give us additional information about them.

Repeated group testing

Recently, the author gave a long series of group intelligence tests to a class of adults in summer school. While the majority of the group maintained fairly well their relative position in the group from first to last, there were two individuals whose records gyrated from top to bottom of the list. The individuals cited were emotional and highly unstable in type. Why not use repeated group testing to identify such types, just as we use a fluctuating IQ in identification of the psychopathic child?

Group norms

Every social group possesses its own individuality. This fact has considerable bearing on the use of norms in group testing. Colvin, writing on the "Construction and Use of Intelligence Tests" in the *Twenty-first Year-Book of the National Society for the Study of Education*, says (page 24):

"The writer's opinion is that in the case of the great majority of mental tests now on the market,

little of definite value can be obtained by the use of the general norms already published."

Such a criticism does not, of course, invalidate the use of scores for classification of the individual within the group, but it does warn the public against accepting figures in an uncritical way.

Extraneous factors in group will-temperament test

The limitations of group intelligence testing hold in increased measure for the group will-temperament test. This should be recognized and each group considered as a unit in itself and the records used largely for classificatory purposes. To repeat, social stimulation operates in such a way as greatly to enforce speed or retardation of reactions. One person may serve as pace-maker for a whole group, just as in a class examination the individual who finishes his paper before time is called may influence in various fashion every individual in the class. The personality of the examiner is also an important matter. The energizing quality of his voice, the degree to which his behavior suggests mimicry, must be reckoned with. Even the seating arrangements must be carefully studied. Those on the outskirts of the group may react less energetically to the examiner than those in more favorable positions. Where time records are to be read from a blackboard, an out-of-focus position may put a man at a distinct disadvantage. For these reasons it is recommended that the usual examiner should not attempt to handle more than thirty in a group. Highly experienced examiners who conduct the test from a platform and

have at their command advantageous seating and blackboard arrangements may perhaps handle larger numbers.[1]

Filter, in an article on "Experimental Study of Character Traits" in the *Journal of Applied Psychology* for 1921, expresses great skepticism concerning the utilization of group testing for character traits. He writes, "The group test introduces an uncontrollable and undesirable factor of competition," and he compares the individual to the group test, to the disadvantage of the latter. Individual testing with the will-temperament material certainly yields a wealth of observations that one fails to get in a group test. And undoubtedly one cannot pass from one to the other without careful analysis of conditions. It is even possible that sliding norms will need to be developed for group testing and the scale set somewhat differently for different groups. But possibly the factor of competition is not "uncontrollable," and certainly not "undesirable" if one is on the outlook for it. Group temperamental testing should issue in a technique for experimental study of certain phases of social psychology. The future may find us stressing this advantage of the group method as vigorously as we now emphasize the ease with which it enables us to multiply records.

Technique for experimental social psychology

Published norms for will-temperament test tentative

The norms published in the *Manual for Group Testing* are merely tentative. Accurate standardization will require time and coöperation among many

[1] The day may come when the phonograph record will be substituted for the human examiner in all test work.

examiners. As they stand, the norms are most satisfactory for speed of movement, freedom from load, finality of judgment, motor inhibition, and interest in detail; least satisfactory for flexibility, motor impulsion, and coördination of impulses. The main value of the group experimental test, apart from its use in educational classification, will be found in the collection by it of material to show how age operates in the acquisition and loss of various capacities and what connection exists between temperamental and intellectual maturity.

Comparable records obtained by individual and group methods

In general, comparable records are obtained when the same individual is tested by the group and individual methods. But the tests of the two series are not wholly parallel in the two forms, as will be shown in subsequent chapters, and this difference must be taken into consideration in comparing results for particular tests. The group test contains no substitute for reaction to opposition. A test for self-confidence is included in the group series as an additional test. In general, the group tests for aggressiveness are less like the individual tests than are the tests for speed and carefulness.

Norman C. Meier, working with a group of high school students at the University of Chicago, used both the individual and group forms of the test, giving first the group and secondly the individual form. The coefficient of correlation for the total scores was .60. Fair correlations were found for speed of movement, freedom from load, finality of judgment, motor inhibition, interest in detail; and low correla-

tion for speed of decision and volitional perseveration. The group norms are most in need of revision for flexibility and motor impulsion.

Carnegie Institute of Technology adaptation of will-temperament test

An adaptation of the will-temperament test for group testing, differing in some respects from that of the author, has been published by the Carnegie Institute of Technology. Correlations have been worked out for the separate items as scored by the Downey individual and the Carnegie group method of scoring and the following general conclusion reached:

> The group and individual tests revealed volitional patterns of the same general type for each subject. There were occasional breaks in the correspondence, but these may have been partly the result of repetition of certain parts in the second testing. This was particularly marked in the checking of traits. Two thirds of the subjects raised their decile standings on this part in the later test, while only one subject lowered his decile standing. In view of all the results of this experiment it is evident that the group test is a fairly satisfactory approximation of the Downey individual test.[1]

The will-profile

The results of the will-temperament test are presented in the form of a graph called the will-profile. The profile exhibits in simple visual form the dynamic pattern suggested by the reactions to the will-temperament tests. The order in which the scores are plotted on the graph follows the grouping given earlier in the chapter: first, the speed items; secondly, the items indicative of drive or personal force; thirdly, the items emphasizing care and persistence.

[1] *Journal of Educational Psychology*, Vol. 13, 1922.

Some will-profiles show a consistent emphasis of the speed items; such a profile characterizes a mobile, rapid-fire sort of person. Other will-profiles emphasize the care and persistence scores; such a profile characterizes a deliberate person interested in detail. An isolated emphasis of the aggressive traits may also occur—"aggressive" being used here to suggest personal force and initiative without involving, necessarily, belligerency. Highly patterned profiles occur with relative infrequency but when found are worthy of careful analysis. Profiles frequently reveal only a slight emphasis of one or two aspects of temperament; sometimes they are best described in negative terms as non-aggressive or careless. There are profiles that run high or low, for all the traits that are tested; there are others that rise and fall irregularly.

Motor impulsion and motor inhibition pivotal traits

The pivotal traits in the will-profile are, possibly, motor impulsion and motor inhibition. Motor impulsion is placed first in the group of aggressive traits, but it might also be thought of as the fifth speed item. An emphasis of these five traits gives us something corresponding to James's explosive will. Motor inhibition, similarly, is given first place in the final group, but it might be included among the aggressive traits.

Highly patterned profiles infrequent

In the next chapter a number of selected profiles are reproduced. Study of these profiles will do much to familiarize the reader with the general purpose of the test. Highly patterned profiles which are relatively of infrequent occurrence will be pre-

sented, as well as less consistent ones. In both instances it will be evident that the general level at which the pattern runs is of considerable importance. A mobile type—that is, a type speedy and flexible rather than aggressive or careful—might still score low on the speed items in comparison with another mobile type, or even with a deliberate type.

The score any individual makes on any trait may be compared (1) with the score he makes on all other traits. This shows its relative emphasis in his own make-up. It may also be compared (2) with the possible score made on it by all other individuals. The pattern of the profile is a matter of relative emphasis of different traits in the same individual; the level at which the graph runs shows the ranking of the individual with others of his own type.

My own focus of interest in the profile has centered in studying interrelation of traits in an individual, rather than a comparison of scores for different individuals. I have made little use of the total score obtained by taking the sum of the scores on all the tests. To this extent my interest has been analytical rather than synthetic and justifies Rugg's statement,[1] "Downey is not interested in a composite measurement of 'personality' or 'temperament'; rather in an analytical 'profile' of the person's component traits."

The total will-profile score

The total score is, however, a more valuable index to personality than I at first anticipated. It affords a convenient measure of force of activity quite apart

[1] "Is the Rating of Human Character Practicable?" *Journal of Educational Psychology*, Vol. 13, 1922.

from any attempt to name the traits that are tested. But its limitations should be realized. Since certain traits in the will-profile tend to be inversely correlated, highly patterned reactions will obviously run low on some traits and so cut down the total score. A very high total score undoubtedly reveals a forceful personality, and a very low score a weak or colorless or psychopathic personality. For an adult a total above 85 is distinctly high, and one below 55 is low.

In conclusion, a brief explanation of what is meant by "mental set" is given.

The mental set

The term "mental set" is used by psychologists to suggest that certain deep-seated tendencies operate in such a way as to determine the direction of attention and the focusing of effort. Often these tendencies lie below the threshold of consciousness and constitute organized systems of inherited and acquired trends. A "mental set" so determined may be spoken of as a native or a habitual "set."

Conflicts occur between a permanent and a temporary mental set

The significance of the term "mental set" is emphasized here because it will be used repeatedly in the following pages. In a number of tests in the will-temperament scale the same reaction is called for, but under different experimental directions. A comparison of these two reactions throws into the foreground the "native" or "habitual" set. For example, a mobile temperamental type will produce a *relatively* more rapid imitation under instructions to imitate as rapidly as possible a specimen of handwriting than a slow imitation under instructions to copy it as ex-

actly as possible. In the first instance the permanent and temporary "sets' enforce each other; in the second they conflict. When the instructions are so general as to permit the subject to follow the line of least resistance, he falls back upon his native (or habitual) "set." In determination of the temperamental type of an individual who gives a generally high- or low-level will-profile, it is important to determine which "set" wins out in case of a conflict or in case the experimental instructions are not specific. The bearing of the "mental set" on the will-temperament test will become clearer as the exposition develops.

Variability in reaction to the will-temperament test

One must anticipate greater variability on a temperamental than on an intelligence test and must recognize that the "cyclothymic" type (see page 8) of personality will be characterized by variable reactions. Younger subjects will, I believe, show a bigger margin of variation than adults, since their reactions are not so definitely "set." Being "test-wise" will affect the outcome of an examination for will-temperament as it does an intelligence examination. With coaching on the purpose of a will-temperament test it is possible to "fake" a pattern to a certain extent, but it is much more difficult for a deliberate individual to simulate a rapid-fire reaction than for a mobile individual to imitate a deliberate one.

In labeling the will-temperament tests with names of personality traits, the author is aware of considerable risk of misunderstanding. The introduction of

a personality term as intermediary between the test and its specific differential value may blur the whole procedure, for, conceivably, the tests of the will-profile may have value even though incorrectly labeled. It is only because interest is stimulated more by the problem of personality make-up than by a bare description of tests that the author has risked naming the traits.

CHAPTER SIX

The Will-Profile

Representative profiles

THE profiles which are selected for study in this chapter have been chosen because they are representative of rather definitely patterned results. Such definitely patterned profiles occur somewhat infrequently. A later chapter will canvass in some detail the significance of a consistent pattern and the effect of maturity and of training upon the pattern. The purpose of the present discussion is to give the reader a notion of how the profiles are to be interpreted.

A word of explanation is due because of the plotting of all but one of the profiles for ten instead of twelve items. The two omitted traits are finality of judgment and volitional perseveration. Tests for these traits were added to the series as an afterthought and scores on them were not available for the subjects who were tested at an early stage in the experimentation.

A brief description of the individuals giving the eight illustrative profiles will serve to indicate their significance. Each of the graphs, it may be said, is an excellent picture of the temperamental make-up of the individual giving it and would be recognized by an intimate acquaintance.

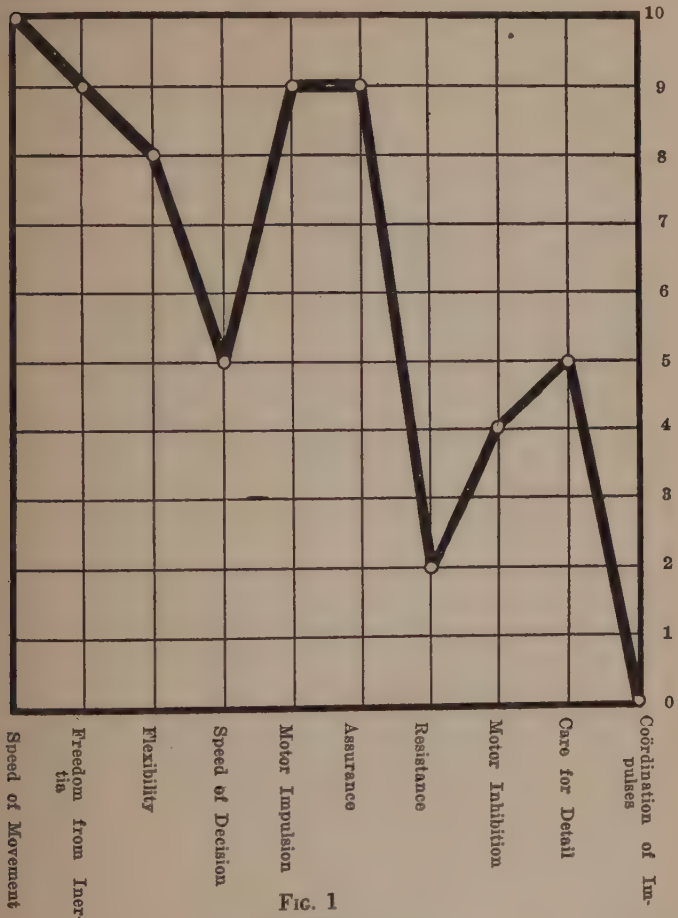


FIG. 1
(Profile I)

I. Mobile type. The original of this temperamental portrait is a young woman, a teacher of physical education, vigorous, alert, athletic, and highly impulsive, but not, it will be noticed, strongly

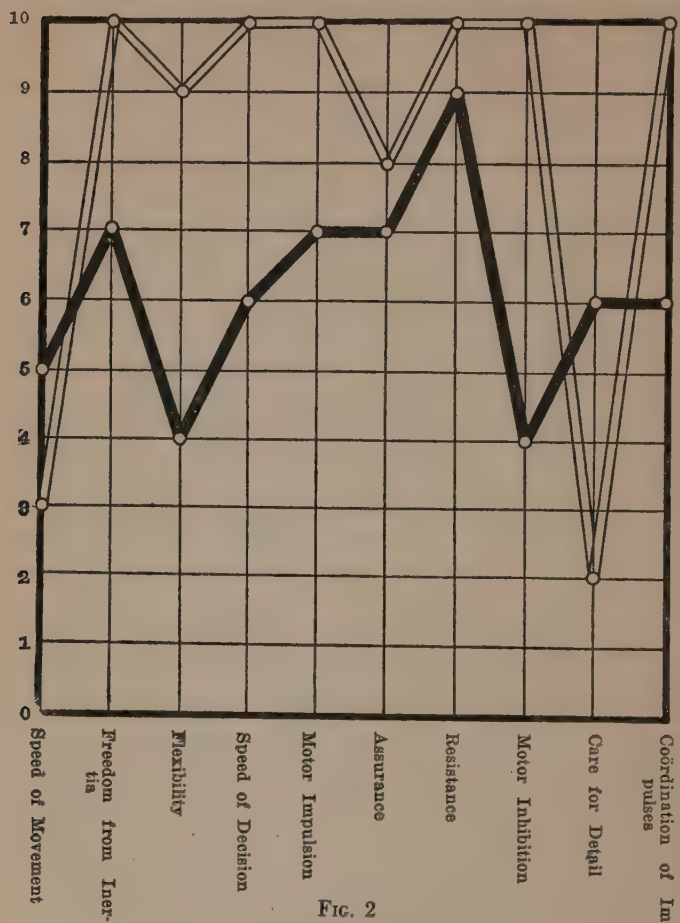


FIG. 2
(Profiles II and III)

aggressive. She is, in fact, a less forceful personality than would appear at first sight.

II. Mobile-aggressive type. This graph was obtained from a young and successful lawyer, particu-

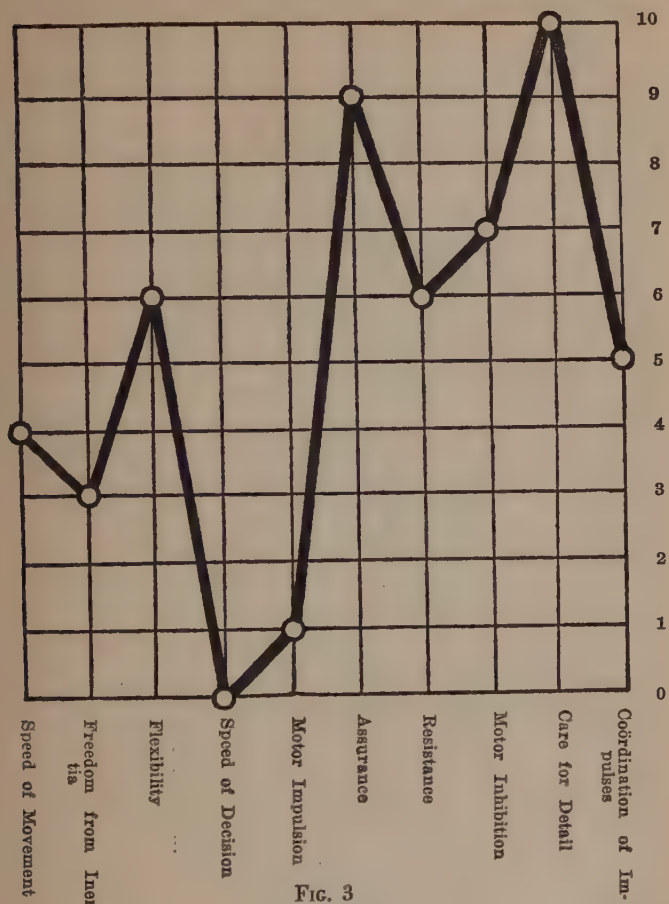


FIG. 3
(Profile IV)

larly strong in court work. His explosive aggressiveness creates an impression of great force. A failure at times in dealing with people might be anticipated from the general pattern, although ex-

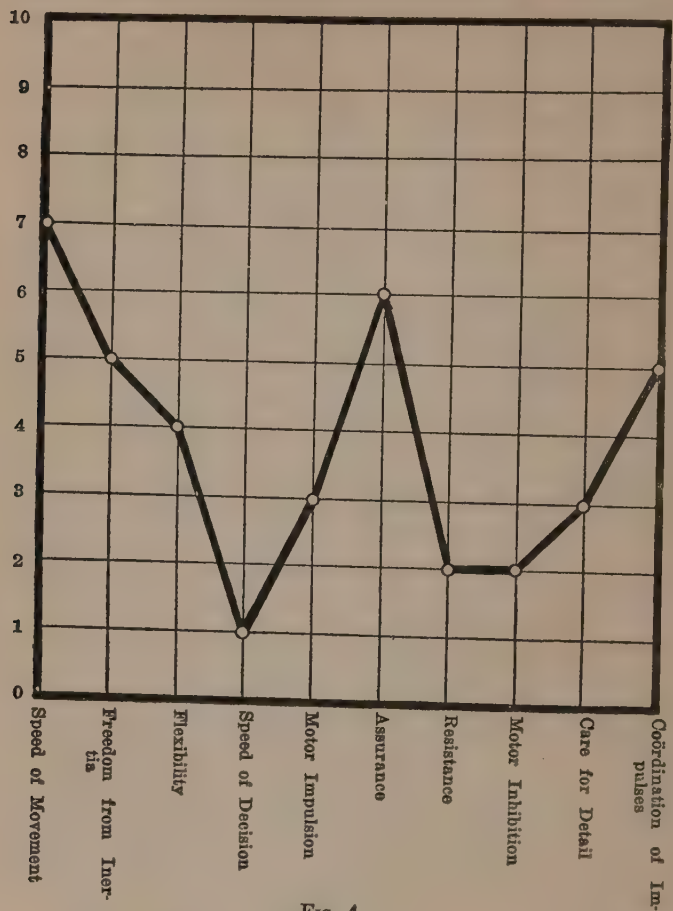


FIG. 4
(Profile V)

cessive aggressiveness is balanced by great flexibility.

The extremely high score on motor inhibition—an unusual occurrence in an individual of so strongly

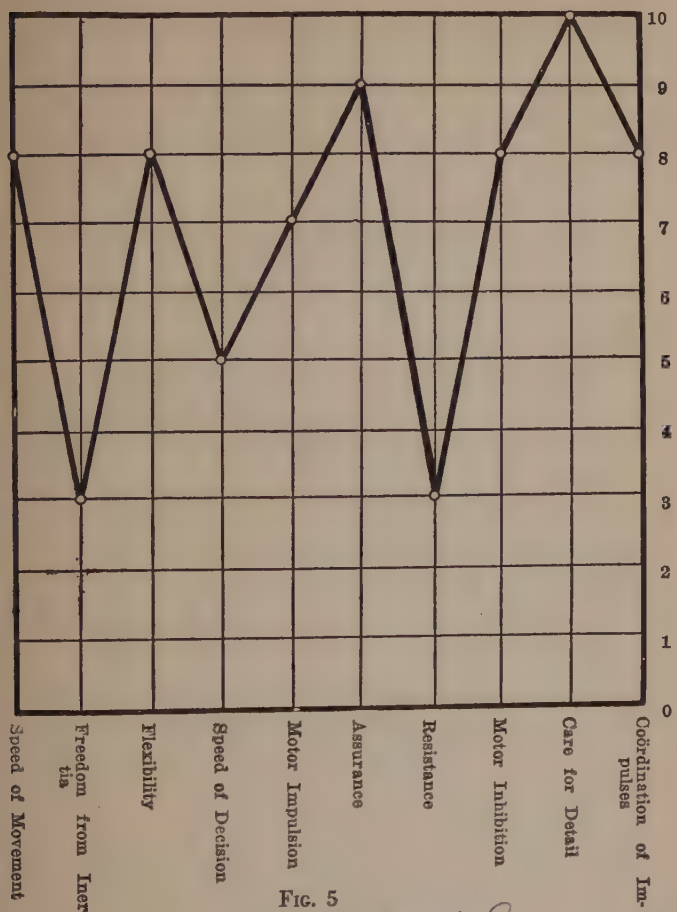


FIG. 5
(Profile VI)

explosive a temperament—was due to a curious "*tour de force*" which will be discussed in the chapter reserved for comments on each test (page 137).

III. Non-specific type. This is the profile of a

college professor, both teacher and investigator. The type is midway between that of the administrative officer and that of the research scientist. It is eminently characteristic of the man from whom it was obtained.

IV. Deliberate type. The original of this profile is a research scientist. The excessive slowness in decision, the low degree of impulsion, and the great care for detail are highly descriptive of the man in question.

V. Low level type. Mature college student; football player. Because of his lack of speed and aggressive qualities, this young man fails to achieve the stellar rôle that would be anticipated from his physique, his exceptional size and strength. He is pleasant, easy-going, not forceful.

VI. Atypical graph. Profile obtained from young woman, college professor. The plan of organization here is less evident than in the other cases. The profile is, I believe, quite as characteristic of its original as the others, but the more complex organization serves undoubtedly to mask certain tendencies. This graph will be discussed in a later connection (page 216).

VII. Psychopathic type. This profile resulted from the test of a young man, rural school teacher and summer school student. He was chosen for examination because his odd mannerisms and poor motor coordinations attracted attention. The prevailing impression was that he was subnormal in intelligence. This did not prove to be the case. By the Stanford-

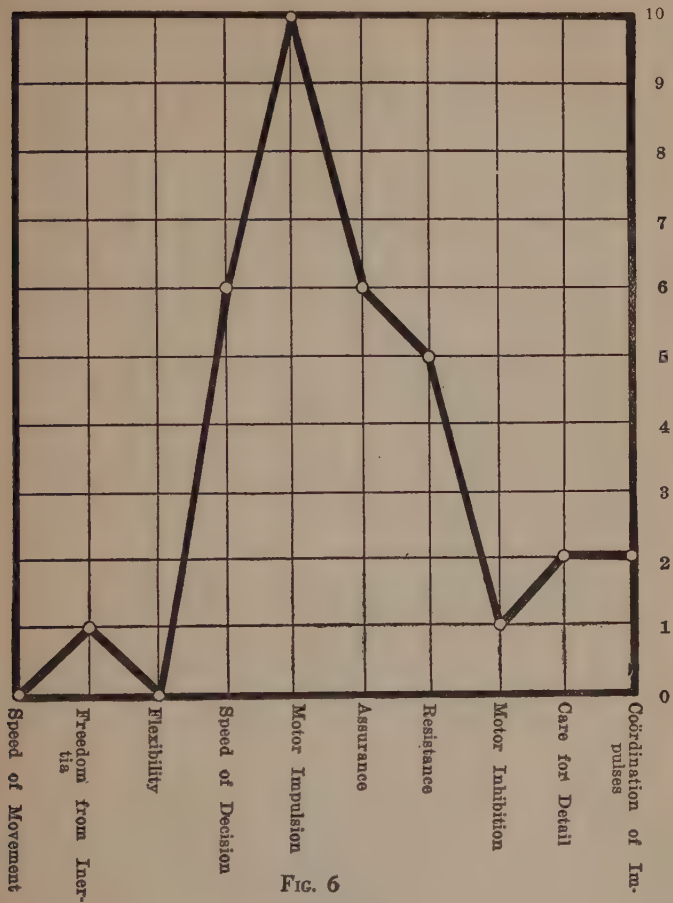


FIG. 6
(Profile VII)

Binet he would be rated as "Dull-Normal"; by the Army Alpha in class C. Both are inferior records for an individual attempting to do college work and engaging in teaching as a profession, but they are not

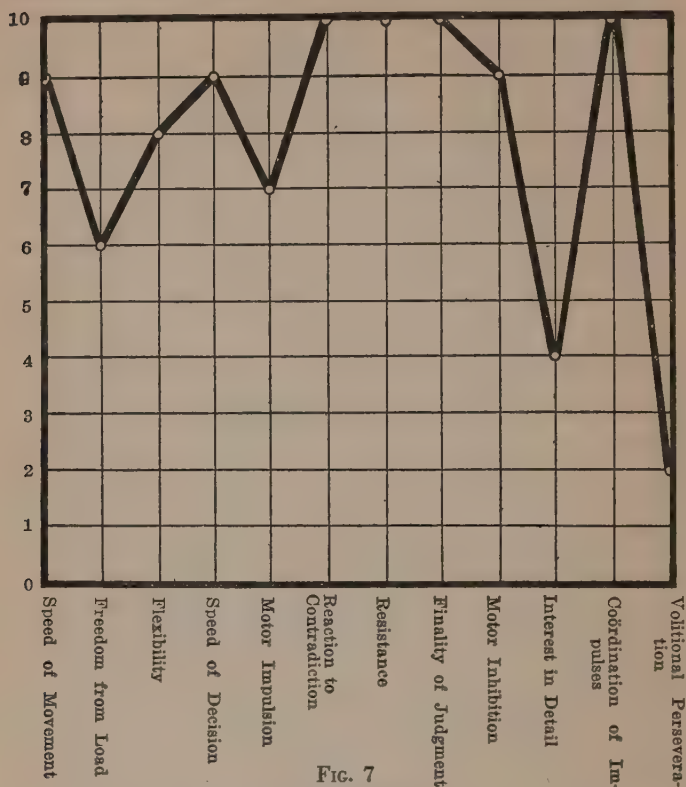


Fig. 7
(Profile VIII)

uncommon among rural teachers. The will-profile suggests a distinctly pathological condition of some sort. The outstanding traits are excessive slowness of movement, great load, and complete lack of flexibility, together with excessive impulsion and failure of inhibition. Slowness and load are evident in the man's college work. He finds himself unable to write more than a few lines during an hour. His

lack of flexibility is illustrated by his reaction in a class of Rural Methods, where, having been taught a time-saving way of dictating a spelling lesson to three sections at once, he finds it impossible to modify it when only two sections are present. He must continue to dictate three words in sequence. This inflexibility is exactly mirrored in his imitation of other hands, where he reverts absolutely to his own highly mannered penmanship, decorated with ornamental t-bars and labored capitals. The high score on motor impulsion suggested excitability, an excitability also evidenced on another occasion in an outburst of violent temper at failing to receive the grades he anticipated. It appears that although a teacher of several years' experience, this young man is never elected for a second term's work.

VIII. Mobile-aggressive pattern. Profile VIII gives the record of a successful woman politician. It is reproduced not only because of its intrinsic interest but because it covers the whole twelve traits of the later test.[1]

[1] The adherents of the traditional classification of the temperaments may find it of interest to attempt to apply their scheme to the profiles that are reproduced.

Profile I suggests the sanguine temperament (quick and weak reactions); Profiles II and VIII, the choleric temperament (quick and strong reactions); Profile IV, the melancholic temperament (slow and strong reactions); Profile V, the phlegmatic temperament (slow and weak); Profiles III, VI, and VII do not lend themselves readily to the old classification.

It is also tempting, although no doubt highly speculative, to try to associate the will-temperament types with glandular formulas. The speedy, impulsive individual would be identified as the thyroid type. With control and endurance added we would have the thyroid-adrenal. The deliberate, slow, careful type suggests Berman's antepituitary type.

CHAPTER SEVEN

Tests for Speed and Fluidity of Reaction

IN the next three chapters the various tests of the will-profile will be commented upon at some length. One chapter will discuss the speed-traits; a second, aggressive traits; and a third the traits that indicate carefulness and persistence.

For each trait the author will show: (*a*) why it was decided to test it; (*b*) how the test is made; and (*c*) what a high or low score in the trait indicates in terms of explosive and obstructed temperament, what other traits it goes with or excludes and what it means in life.

In this chapter there will be discussed Speed of Movement, Freedom from Load, Flexibility, and Speed of Decision.

I. SPEED OF MOVEMENT

Speed of movement

One's speed of movement is obviously a matter of considerable practical importance, since it determines the amount of physical work that one can put through in a given time. In trade-tests and in vocational tests in general, speed has been recognized as a factor in accomplishment on a level with the factor of accuracy.

Commenting on motility as an element in the human make-up, Seashore says:

Motility in child's make-up

> It is extremely interesting—to interpret the work and play of the child in such terms, noticing how this fact of slow, average, or quick motility not only accounts, in large part, for his achievements in work and play, but also serves as a key to his interests, his ambitions, and in many respects to his feelings and sentiments with reference to his environment.[1]

Speed of writing an index of speed of movement?

In the individual form of the will-temperament test, speed of movement is measured by the time taken to write the phrase "United States of America"; the mean of two trials is used. Tendencies to a retarded or a premature reaction to signals should be recorded. In the group form of the test, the number of letters written in twenty seconds is employed as a measure of speed of movement. In both the individual and the group form of the test, size of writing is ignored in giving the score. This introduces a slight error in the scoring, since the correct but impracticable procedure would be to calculate the time per millimeter of graphic movement.

The most serious question that can be raised concerning the use of graphic speed in the test is that which asks whether rapidity of handwriting is, in any way, an index of general speed of movement.

In another connection the author has shown that graphic speed is, in fact, symptomatic of general bodily speed of movement.[2] It has, furthermore,

[1] *The Psychology of Musical Talent*, pages 173 ff.

[2] *Graphology and the Psychology of Handwriting*, Chapter 7.

been found to correlate with speed in other specific activities (rapidity of tapping or articulation, for example); and it correlates, as will be shown later, with all the other items in the speed group, which can only be interpreted as meaning that it has general characterial significance.

There are, however, several limitations on the use of handwriting in getting at general speed of movement, which should be kept in mind.

Physical condition

(1) One expects to find some variation in speed of writing under different physical conditions, a variability which may affect the score considerably, since in many cases the records of adjacent groups differ by a fraction of a second only. Repeated trials with the test indicate that as a matter of fact there is rarely a shift of more than one or two steps on the scale.

Practice

(2) Practice, of course, has some influence upon speed of writing. It may even be cited by critics as the most influential factor in determining speed of handwriting; those who are most accustomed to writing will be thought to be those producing the greatest amount of written product. Practice is not, however, the sole determinant of speed, as is shown by the fact that equally practiced penmen write at very different rates. The different systems of writing used may account in part for this difference in speed, but even with the same system of penmanship, writers vary in speed in obedience to such general factors as "drive," forcefulness, and carefulness.

When the amount of practice varies widely as

between individuals of differing social status or of different professional requirements, practice should be taken into consideration. Different norms should be established for different social and professional classes. With more extensive use of the will-temperament test this will be possible. Up to the present time, the records utilized in getting the norms are largely those of well-educated adults. The wide range of achievement that has been scored in the individual tests suggests the desirability of having different norms for different social groups.

Social and professional differences

(3) Another influential factor that affects handwriting speed, just as it affects the speed of all other bodily movements, is that of age. In a later chapter (page 252) the effect of age upon speed of movement will be canvassed in detail.

Age

(4) There are a few specific inhibitions which affect handwriting as distinct from other types of activity. These inhibitions should be recorded when they are known to exist. They are largely in the nature of habit-interferences and include shifts in the hand used in writing (from right to left hand or the reverse); changing from one system of handwriting to another (as a shift from vertical to Palmer method); muscular fatigue of the hand. In testing individuals where such inhibitions are in force, or in testing illiterates or children below the seventh grade, a substitute speed test is suggested as advisable. This substitute test is that of speed of tapping. It will be discussed in Chapter X.

Habit conflicts

In discussing further the significance of some test

for motor speed, it may be said that speed of movement is eminently characteristic of the explosive temperament.

In everyday life, we note the rapidity with which different individuals walk, gesture, or talk, play tennis, shuffle and deal cards, seal and stamp an envelope. A man who scores 10 on this trait for the will-temperament test will show brisk, well-coordinated movements. There will be an absence of flurried, restless, excess movements which absorb energy without producing any results. The man scoring low usually shows an absence of "pep"; his leisurely movements may be very exasperating to a more mobile type. Dressing may be an interminable process; signing his name, "a major operation." Sometimes a low score is associated with restless, ineffective movements which give, falsely, an impression of speed. The plunging horse does not cover the most ground.

Speed of movement

Positive correlations

Speed of movement is found associated in general with freedom from load, flexibility, and speed of decision. Evidence of this was obtained by plotting scatter-diagrams for one hundred records on speed of movement, equally divided between the ten possible scores. This method of studying the relationship of the different traits affords only a crude indication of the degree of correlation but gives an opportunity for studying the significance of each separate score, which at the present stage of development of the investigation is desirable. It has been employed with each test in turn.

Where a chance agreement within three places, on the scatter-diagram, might be expected in 58 per cent of cases, there occurs for speed of movement and speed of decision 69 per cent agreement; for freedom from load, 75 per cent agreement; and for flexibility, 67 per cent agreement.

The Carnegie group test for speed of movement was found to correlate with the Carnegie group test for freedom from inertia, +.60; with flexibility, +.45; and with speed of decision, +.43. The Carnegie speed of movement test correlated with the individual test of the will-temperament, +.72.

Negative correlations

With the aggressive traits, speed of movement shows no very definite relationship except for a slight tendency for those scoring very high on speed of movement to score high on reaction to contradiction also.

In the group of tests for carefulness there is evidence of a negative correlation of speed of movement with interest in detail for those making a 9 or 10 score on speed of movement; also a generally inverse correlation with volitional perseveration—only 44 per cent agreement within three places as against a 58 per cent chance agreement. This negative correlation with volitional perseveration agrees with Lankes's finding of a negative correlation between speed of tapping and perseverative tendencies. (See page 157.)

With coördination of impulses, there is a moderately high correlation, 69 per cent of agreement. The Carnegie group test, which gives greater weight

than the individual test to speed as a factor in co-ordination of impulses, finds a positive correlation of .50 between it and its test for speed of movement.

Thus we see that the man rapid of movement tends also to be quick in decision, free from load, flexible, somewhat assured, and able to handle a complex situation, but he is neither strongly interested in detail nor of perseverative make-up.

II. FREEDOM FROM LOAD [1] (RATIO OF NATURAL SPEED TO CAPACITY SPEED)

The phrase "freedom from load" suggests that the psychic machinery runs with little friction; it is not necessary to oil it continually in order to keep it going smoothly and speedily; its own inherent energy holds it at top speed. It suggests a thrifty management and is of great practical importance.

Freedom from load: ratio between time of normal and speeded writing

As an index of a tendency to maintain speed without external pressure the will-temperament test uses the ratio obtained by dividing the normal by the speeded time of writing, an average being obtained from writing the name and the test-phrase, twice each. With extreme speed in the normal, the ratio approximates 100; in case of very great inertia or "load" the speeded writing may be twice as rapid as the normal. Occasionally a low ratio is obtained which indicates not lack of inertia, but complete failure to speed even under pressure: such excessive "load" shows itself in the very great slowness with

[1] Stone speaks of this test as a "Tension" test.

which both normal and speeded writing are done. Under too great pressure individuals of this type go completely to pieces.

In getting the ratio as explained above, the writing of both name and phrase is utilized. Separate tabulation of ratios obtained from name and phrase indicates slight differences in the conditions holding for the two. The fact that the name was written before the subject had warmed up to the test resulted frequently in a higher index of inertia for the name than for the phrase, in spite of the fact that practice has had more chance to influence the normal speed with which the name is written. Another factor which increases "load" in writing the name is the high degree of consciousness with which it may be written. In any case there are more extreme records evident in writing the name than in writing the test-phrase.

That the ratio of speeded to normal writing-time is actually an index of amount of general inertia or "load" appears highly plausible from a study of the records of individuals with whom I am intimately acquainted. Those who score high on this test are individuals who keep up with or ahead of the docket without flurry; they are punctual in meeting appointments even when little is at stake; they are "up" at the first whiz of the alarm clock; "off" at the first click of the pistol. Those who score low are individuals who only complete a task on time by extreme exertion at the end; or if external pressure is not present they may put today's work off

until tomorrow. Their difficulty in putting through a crowded schedule may be due either to a tendency to relax as soon as pressure is removed or to a form of inertia that makes it very hard to get started at all. In the latter case one can almost hear the machinery beginning to whir before such an individual gets into action! Note, for example, the pause that precedes his answer to a simple question, or his lag in a conversational race. In making a speech he hems and haws; in playing a card-game he needs to be stimulated by "Your turn to play!"

The "lazy" individual

When "load" is merely an expression of a tendency to relax, a great deal of it gives us the person described usually as "lazy." This "lazy" individual may, however, have at his disposal a fund of reserve energy upon which to draw in an emergency. Individuals whose professions include the handling of emergencies, such as physicians, trial lawyers, or public speakers, may be all the more efficient for the possession of a moderate amount of load. The individual who maintains top-speed as a customary thing is apt to give out periodically, sometimes when it is of serious moment to do so.

Moderate amount of "load"

The other form of load is closely connected with perseveration, which will be discussed later (page 150). This variety of load is shown in difficulty in getting started at all. It is the underside of perseveration which suggests difficulty in stopping after you once get started. Individuals so "loaded" are apt not to relax easily: they are unable to dismiss

a problem from mind; as is true for the perseverator, in general, they may solve problems by sheer force of brooding upon them, through incapacity to change the direction of thought.

Habit

The acquisition of a variety of habits tends to obscure native load somewhat, for "loaded" individuals may become the slaves of a daily program, since such procedure minimizes exertion. With sufficient practice they may even show considerable speed in a specific habitual activity. Their success in life will be more definitely determined by the number and kind of habits they form than is the case with the opposite type, who can with very little effort "turn over a new leaf" with each page of the calendar. The masking of load by habit may occur in the will-temperament test for certain highly practiced penmen. This is a source of error that needs to be kept in mind.

Correlations

Turning to a consideration of the relationship of freedom from load to other traits, we find it correlates highly with speed of movement (76 per cent of agreement within three places, where chance agreement would be 58 per cent). It also correlates with speed of decision and slightly with flexibility.

In the Carnegie adaptation of the will-temperament test, freedom from load is found to correlate positively with all three of the speed items as follows: speed of movement, .60; flexibility, .45; and speed of decision, .43.

Of the aggressive traits freedom from load shows

a slight positive relationship only with resistance. With the third group of traits it shows a negative correlation with interest in detail.

III. FLEXIBILITY

The capacity to do things differently, to be able to modify one's habitual procedure, to depart from routine, is a valuable gift, particularly for the man or woman who deals with people or with situations that change continually.

Flexibility; skill in disguising handwriting; imitation of hands

Disguised handwriting and imitation of model hands are used in the will-temperament test to measure flexibility. This departure was suggested to the author by the work done by German handwriting experts who have probed the attempts of anonymous letter-writers to disguise their writing, and of men who try forgeries by imitation. These investigators believe that successful disguises and imitations are produced by a fluidic type of person. Graphologists, who attempt to read character from writing, have adopted this suggestion of the handwriting experts, who are interested mainly in the legal aspect of disguises and imitations, and derive from it the principle that, in general, ability to change one's handwriting individuality is a sign of dramatic or histrionic ability.

The author's own experiments on disguised handwriting suggested that the adaptable, flexible type of person was more expert in disguising his hand than the inflexible person with stereotyped habits. She found,

however, that there was a difference between a studied elaborate disguise and a quick dramatic one. The former gave evidence of ingenuity; the latter showed dramatic gifts. Success in disguising one's handwriting has been used in the will-temperament test as a partial measure of flexibility, without attempting to distinguish between an ingenious and a dramatic disguise. In addition to using success in disguising handwriting as a measure of flexibility, success in imitation of model hands was used.

Mental set

In preliminary experimentation an imitation of a model was asked for without further instructions. It was found that under such conditions the native "mental set" (see page 73) toward speed or accuracy operated so strongly that it was impossible to compare records from different subjects, some of whom settled down to an *exact copying* of the original while others dashed off an *impressionistic imitation.*

Subsequently, two imitations of one model were included, and one of a second model. In the first case, a rapid imitation was requested; and, later, an exact copy. For the second model, no instructions as to speed or accuracy were given; the subject was told to choose his own speed. The time of the rapid imitation (or, in the group test, the number of letters produced) and the success of the imitation as a copy of its model was scored and used as a partial measurement of flexibility.

Correlations

The scatter-diagrams indicate that flexibility correlates with all the other speed items, but highest with speed of movement. This agrees with the

Carnegie correlational coefficients. It also correlates positively, but slightly, with assurance and resistance; with finality of judgment it gives a slight positive correlation. A high positive correlation occurs with coördination of impulses and interest in detail (an agreement within three places of 70 and 72 per cent respectively). The high correlation with coördination of impulses agrees with the Carnegie report of correlational coefficients, but not so the positive correlation with interest in detail. With the latter the Carnegie investigators report a negative correlation. Further analysis will be necessary to locate the point of discrepancy.

Inflexible and flexible individuals

In everyday life, flexibility shows itself in many ways. On the one hand we have the individual of slight flexibility who follows an unvarying routine and is upset if his schedule for the day is broken into or his armchair shifted from the north to the east side of the room. Hours for getting up in the morning and for retiring, for breakfast, dinner, and supper are as unalterable as the laws of the Medes and Persians. There is only one pie-pan in which a superlative apple-pie can be baked; only one seat in church from which the sermon can be properly assimilated. The inflexible person follows implicitly his teacher's way of doing a thing; he introduces no short cuts, no innovations. As one young lady informed the author, when instructed to write just as slowly as she possibly could, "It is against my principles to do this; I have been taught Palmer method!" Persons of this type yield slowly to new inventions.

They carry candles long after their neighbors have stand-lamps; they light lamps when others are pressing electric buttons. Frequently they seem lacking in tact; they cannot be all things to all men, at least not in a hurry.

The man who scores high on flexibility may be so mercurial in make-up that he rejects routine impatiently. Schedules, programs of work, fixed ways of doing things are honored more in the breach than in the observance. He is able to shift his personality as he turns from one companion to another, or as he walks from the street into the church. Chameleon-like, he takes color from his surroundings. New inventions, novel fashions, quaint tricks of speech make instant appeal to him.

Between these extremes we find all manner of variation in the individuals of our acquaintance. The relatively flexible person we find most at home where he must deal with people or with a constantly shifting environment. The inflexible person achieves much in routine work and those situations that are mastered mainly through the acquisition of definite habits.

IV. SPEED OF DECISION

Speed of decision: time for checking character traits

In the will-temperament test the subject is asked to check from a list of character traits those that are descriptive of himself. *The purpose of the test is to determine the speed of the subject in reaching decisions,* a matter of much moment in many situa-

tions. The time taken to complete the task varies in the testing of individuals from less than one minute to more than fifteen minutes.

Mode of reaction

Some psychologists who have been kind enough to send me criticisms of the will-temperament test have thought that the purpose of this test is to see how accurately the subject describes himself in the list of traits checked. This is not the case. The list of traits is not chosen in order to furnish the examiner information about the examinee, but to determine how long it takes the examinee to make up his mind concerning the traits he possesses. Therefore, it is immaterial that the pairs of traits used in the test are not in all cases true logical or even pyschological opposites.

A moderate degree of hesitation in marking the traits shows, of course, normal care and deliberation. Some extremely rapid records give evidence of considerable carelessness and inaccuracy. This was noticeably true for my abnormal and very young subjects. On the other hand, many of the rapid reactions are certainly as accurate and enlightening as the slower ones. In any case the mode of reaction and not its accuracy is the point in question. The rapid, careless reaction is as valuable from the present point of view as the slow and excessively critical one, while the revelation of hypercritical or quibbling tendencies is a valuable indication of the obstructed temperament.

Self-consciousness

A valid objection to the speed of decision test in the form in which it occurs in the will-temperament

scale is its use of material that arouses self-consciousness. Individuals who decide rapidly are evidently not upset by the material employed, but some of those who decide slowly might not do so if self-consciousness were eliminated.

Carnegie will-temperament test

The Carnegie adaptation of the will-temperament test has improved it at this point by having the list of character traits it uses checked twice.

In the first reaction the subject is asked to "Check the *one* trait in each pair which you believe is the *better* in most circumstances."

In the second checking the subject is instructed to "Check the *one* trait in each pair which describes you *better*."

The Carnegie instructions are well suited to calling out self-consciousness, and the checking of traits in this way yields a double score, one for speed of objective decision and the other for speed of subjective decision, where self-consciousness is involved.

The coefficients of correlation for the speed of decision test as given in the Downey will-temperament test are .42 with the Carnegie objective speed of decision test and .46 with the Carnegie subjective speed of decision test.

Positive and negative correlations

Using the records as obtained in the original test, speed of decision is found to correlate positively with freedom from load and flexibility (64 per cent agreement within three places). It also correlates positively with resistance and finality of judgment and motor impulsion (72, 64, and 63 per cent agreement within three places). With volitional perseveration

it gives a negative correlation, and with interest in detail there is a negative correlation for the highest scores on speed of decision. No individual who scored 9 or 10 for speed of decision made more than 6 on interest in detail.

The Carnegie correlational coefficients agree with the above results, except that a negative correlation is found in general with interest in detail, and a high positive correlation with coördination of impulses, a test on which the Carnegie method of scoring differed somewhat from the Downey method.

The "character" a subject gives himself

An interesting side light on a subject is obtained by noting the character traits he assigns himself, since in many cases an optimistic or diffident choice of traits is evident with or without manifestations of self-consciousness. In a few cases suggestibility operates; the examinee is prone to continue checking traits in the column in which he first started.

The greatest amount of blocking occurs on the marking, first, of intelligence and character; and, secondly, of "modest" or "vain." In the former case an interesting revelation of the subjective effects that we may expect to result from mental tests was evident. A number of my subjects who had been rated by psychological tests remarked confidently, "I know I'm superior—by the tests." Even so, one who was most assured of the accuracy of her psychological rating blocked in an agony of indecision over actually putting a check on the paper. Many seemed to think it impossible to mark both "modest" and

"superior in intelligence," and definitely balanced which alternative to put on record!

The reactions of a few subjects are absolutely non-committal on every point, since they qualify each decision to such a degree that it eventually becomes worthless. Whether or not such individuals really do give a non-specific or balanced will-profile I have not yet determined.

Age

Records on the speed of decision test show that there is a progressive retardation in making decisions with increase of age. The median record at thirteen years is definitely more rapid than that obtained from seventeen years on. This slowing down of rapidity of judgment as maturity approaches is highly interesting. It is at first motivated by increase in carefulness. It continues throughout life, although possibly there is an acceleration again at the old-age end, a conclusion suggested but not proved by the few old-age records at my disposal. There is also for the younger years some slight evidence of negative correlation between intelligence and speed of decision.

Double checks

The number of double checks in the individual test is indicative probably of a self-confident, assured attitude. It would parallel the number of double-underscores in the False-True testimony test in the group form of the series.

Envelope test

The preliminary part of the contradiction test, where in the individual test the subject chooses one of two envelopes, said to contain an easy and a hard

test, reveals individual attitudes in reaching a decision where deliberation is perfectly futile. An elaborate pondering of the situation certainly serves no purpose whatsoever, since there is no way to determine which envelope contains which test. And yet reactions range from the subjects who snatch the envelope from the examiner's hand in a fraction of a second to those who ponder the matter from half to three-quarters of a minute. I have not used this reaction in scoring my records, partly because of inaccuracy in the earlier records in scoring the time of reaction of the very rapid subjects, but it would be perfectly feasible to add the time of this reaction to the total for checking character traits, weighing it properly.[1]

The most rapid reaction in this test is about .5 of a second, while the most rapid in the other decision test would average 3.4 seconds per choice. The medium records in the former are two or three times as rapid as the medium rceords in the latter. On the other hand, the very slowest decision in both cases is about 40 to 45 seconds. But prolonged deliberation in reaching a decision in the envelope test is much less logical than in checking character traits.

Some curious reasons may apparently govern the choice of a particular envelope. Some reagents at-

[1] Multiplying by 3 the time taken in the choice of the envelope and adding this to the total time for checking of character traits would probably give the proper weight to this test. It would then be necessary to establish new norms for the speed of decision test, although the scores would not be greatly changed.

tempt to discover the one containing the easier or harder test by a purely subjective form of reasoning. For example, "This is camouflage; we're to be induced to choose the harder. N has fewer strokes, looks easier; we're to be fooled into choosing it; therefore, I choose M."

Among the many reasons cited for choice, choosing the envelope nearest or to the right is only occasionally mentioned; and yet this must have been the deciding factor in a very great number of cases, since 80 per cent of the subjects choose the envelope to the right. A curious commentary upon our inability to identify our own motives for choice!

A still more significant reaction arises in the case of subjects who under contradiction retract their first statement to the examiner and then cite their reasons for choosing the envelope which as a matter of fact they *did not choose*. These curious illusions of memory would make interesting material for study, although they do not occur frequently and it would take some time to accumulate a number of them.

Variations in speed of decision may be studied in a score of everyday situations. Watch, for example, your neighbors selecting their luncheon dishes at a cafeteria, or your partner at bridge, or your sister deciding whether or not she will buy a certain hat! In the cafeteria contest one friend may be picking out his dessert while another still lingers at soups; your bridge partner may be playing his card while you are still eying him thoughtfully; your sister may give you time to write a whole chapter on character

traits while she makes up her mind whether or not to risk a particular style.

Not all our acquaintances amaze us by their speedy or delayed decisions; moderate individuals are the rule. When you invite some one to take a walk with you, you do not as a general thing expect him to be out of the house before the invitation is completely worded or debating the issue in the house a half-hour later, but such contingencies may arise.

CHAPTER EIGHT

Tests of Aggressive Traits

I. MOTOR IMPULSION

ONE hears today a great deal about "drive" as constituting a most important factor in a person's make-up. It involves the idea of energy, and of the focusing of energy.

Motor impulsion refers to amount of energy available and its freedom

There are two factors to be tested for in estimating "drive": first, the energy available when brakes or inhibitions are off; secondly, the ease with which the brakes or inhibitions may be thrown off. Emotional drama gives us at times marvelous exhibitions of the explosive possibilities of an individual of the expressive type. Recall, for example, the tremendous outburst of passion at the climax of David Warfield's "Music Master." The same dramatic presentation illustrates also power breaking loose from great restraint.

The explosive individual in life

In daily life one sees many examples of the explosive type of person, the one of strong impulsion who scores highest on this test. For him to have an opinion is to express it. He monopolizes conversation, leads movements of reform, is a convincing speaker, and sells himself well.

I may cite in this connection an interesting con-

crete example of what I mean by explosive expressive tendencies. Recently, after scoring a record for motor impulsion, I remarked that the individual who had just been scored 10 for this trait in a group test should, if as explosive as the sample of writing indicated, give further evidence of it. With this thought in mind I turned over the leaves of the booklet and found three evidences of great impetuosity. Three unsolicited comments on the tests had been entered. On the title page the individual in question had written above the word *Test*, "Acid." After his disguised hand he had penciled, "Rah! Rah!" and after his practice on disguises of handwriting, "Bunk!" How typical of the uninhibited individual!

The obstructed person

The man who scores low on impulsion fills in the backgrounds of life and may put himself on the bargain counter. It is one variety of this type whose resolutions are sicklied o'er with the pale cast of thought, apropos of which the following verse is quoted by Gowin:

> The centipede was happy quite
> Until the toad for fun
> Said "Pray, which leg goes after which?"
> Which worked her soul to such a pitch
> She lay distracted in the ditch,
> Considering how to run.

James's scheme of the four types of will, namely,

I. Explosive Will
  (*a*) Exaggerated Impulsion
  (*b*) Defective Inhibition

II. Obstructed Will
(*a*) Exaggerated Inhibition
(*b*) Deficient Impulsion

will be used in the following account because of its descriptive value. It does not in itself have an explanatory significance.

More than one physiological cause for increased or diminished impulsion

Physiologists state that it is necessary to recognize more than one cause of impulsion. Any simplification of the pathways that make for nervous discharge will increase free release of the nerve impulse, any complication will stem the release. Complications may occur on the sensory side—conflict of ideas—or on the motor side—conflict of habits, or instincts. Impulsion is also determined by chemical excitants that act on the organism. One might have impulsion so conditioned with extraordinary complication of impulses, in which case a complex personality would result. It is not possible in the test for motor impulsion to determine the physiological conditions operating to produce various reactions.

Change in size of writing under a distraction

In testing motor impulsion, the score was determined by the speed with which writing could be maintained when attention was distracted from it and by the magnification or decrease in the size of the handwriting under these conditions. Distraction of attention serves, that is to say, to release for many individuals an automatic reaction which is rapid and extensive in the degree to which the motor discharge is free *and* strong.

The utilization of change in size of writing under distraction of attention as an index of motor impul-

sion was suggested by previous work both on automatic writing [1] and on muscle-reading.[2] The tendency to magnify or to decrease handwriting-size not only under conditions of distraction, but even with such a simple change in conditions as results from withdrawal of visual control in writing with the eyes closed, is an individual characteristic of considerable significance. Extensive experiments with subjects had shown me that it was quite possible to anticipate the value of an individual as a guide in muscle-reading by his tendency to magnification of graphic movement when inhibitory checks were removed. One's value as a guide in muscle-reading is in turn significant of the degree to which one possesses the explosive in contrast to the inhibited temperament.

So much seems fairly plain. The attempt, however, to arrange a scale for grading on the basis of variation in size of automatic writing involves considerable difficulty. In the first place graduations in size are continuous and it is not easy to draw lines of demarcation, and in the second place the situation is complicated by the time factor, namely, increase or decrease of writing rapidity. In the case of very great time retardation, due to slow fluctuation of attention from writing to the distracting process, an increase in size may result not as an outcome of automatic tendencies, but as a result of attention concentrating on each letter serially—a possibility that must

[1] Downey and Anderson, "Automatic Writing." *American Journal of Psychology*, Vol. 26, 1915.

[2] Downey, J. E., "Muscle-Reading." *Psychological Review*, Vol. 16, 1909.

be taken into consideration in judging certain hands.

Speed of writing under distraction

In scoring it was necessary to consider both size and speed of writing under distraction. No data were available to show which factor was of the greater importance, but from previous experience I felt the size factor to be of more significance than that of time. Usually for those who score high or low, the two factors are in agreement; only in the intermediate groups is there some doubt as to the proper rating.

Possibly the ease with which control is thrown off and the motor discharge given right of way is evidenced by the increase in the size of writing under distraction; while the force of the impulse that is thus set free is evidenced by the rapidity with which the writing goes on.

Reactions to the present test have been observed in support of this proposition. There are, for instance, subjects who respond with ease to distraction by producing an automatic hand, but a slow one. The brakes are easily thrown off and the impulse given way, but their writing resembles the movement one gets in similar cases in muscle-reading; it is extensive but rambling and inconclusive. It recalls James's type of will, explosive because of deficient inhibition.

A more baffling reaction, and a very rare one, shows decrease in size of writing but increase in its rapidity when distraction of attention is attempted. In such instances inhibitions are not removed. Instead of an automatic writing resulting, a highly controlled and tense hand appears. Its great rapidity, under conditions of mental complexity, bears witness to

the subject's energy, while his failure to take the easiest way out (turning writing over to habit) indicates strong inhibitory tendencies. He is a representative of James's type of will obstructed, because of exaggerated inhibition.

Natural writing of expansive individuals large

Besides the complications of speed and size there are other possible errors in the scoring of motor impulsion. One is linked with the fact that the natural writing of impulsive individuals is large and that this size may limit the possibility of a very great increase in amplitude with increased automatism.

Allport and Allport have made an interesting comment on this type of hand. They say: [1]

> In certain cases we have known the handwriting of expansive persons to be unusually large and, to use Dr. June E. Downey's expression, uninhibited or impulsive. In regard to motor expression in general, certain expansive persons when tested have shown pronounced tendencies to overestimation in kinesthetic reproductions of distances; certain cautious persons are prone to underestimate.

Art teachers are aware of an inclination on the part of some individuals to enlarge on a copy set for them, while others reduce the copy. An inclination to enlarge is more favorably regarded than is a tendency to decrease, as one might anticipate from psychological principles, since it betokens freer impulses. The author's mother—very decidedly expansive in make-up—shows in china-painting a con-

[1] *Op. cit.*

tinuous enlargement of the design running through sets of twelve plates or saucers. With growing automatism it requires conscious effort for her to keep her pattern within set limits.

Allport's expansive individual is undoubtedly akin to the explosive type whom we are now considering, whose increase of size in handwriting under distraction may be concealed by the largeness of the natural hand.

Measuring writing amplitude

Another point that needs consideration is the degree to which a crude estimate of increase in size checks up with an accurate measurement of writing amplitude. The author's simple technique involves measuring with a celluloid millimeter ruler the horizontal extension of the signatures that are being compared. Several attempts have been made to determine the amount of error inherent in such procedure. I had hoped to use the Curvimeter put out by Amsler-Laffon and Sohn for measuring writing amplitude, but experts who tested out the instrument for me not only found its manipulation too tedious for practical purposes but also discovered that unless readjustments are continually made the record is far from accurate. The most practicable method of measuring handwriting with which I am acquainted was devised for me by Mr. Elmer Nelson, Civil Engineer, Laramie, Wyoming. A guide line is inked on tracing cloth and the measurement of the writing pricked on the tape, the tape being revolved about a vertical axis at points where the direction of the

line changes. As graphic movements come to be analyzed more and more, such a device should prove more and more serviceable.

Mr. Nelson measured for me fifteen records so chosen as to cover the ten steps in scoring. My crude measurements checked up well with his exact ones and showed the possibility in general testing of depending upon comparison of the horizontal extension of signatures.

Group test for motor impulsion

The group test for motor impulsion is very much less satisfactory than the individual test for the trait. It is a simple matter for individuals to "fudge" on the test. For this reason the examiner must utilize every atom of energy he possesses in order to hold the attention of the group concentrated according to instructions. The norms for scoring are also less satisfactorily standardized than in the individual test, and the utilization of a different type of distraction (the counting of rhymes) probably introduces a discrepant condition.

The scatter-diagrams show a high positive correlation of motor impulsion with flexibility and finality of judgment (72 and 73 per cent agreement within three places); and a slight correlation with reaction to contradiction and resistance (65 and 66 per cent agreement within three places). A negative correlation is found for motor impulsion and great interest in detail. No subject scoring 10 for motor impulsion scored over 6 for interest in detail, and the majority of them scored 3 or less. Some interesting relationships with various degrees of motor inhibition are re-

vealed by the scatter-diagram. These will be discussed a little later (see page 141). The classification of motor impulsion as an aggressive trait is justified by a study of the interrelationships of the items in the will-temperament test.

II. REACTION TO CONTRADICTION: SUGGESTIBILITY

Suggestibility

Suggestibility or susceptibility to suggestion is a personality trait of considerable importance. Considered from the social standpoint, the suggestible person is the adaptable, tactful individual who is easily put *en rapport* with his environment. Thus Baldwin emphasizes suggestibility as a characteristic of his motor self-confident type in contrast to the more critical attitude of the sensory type. In muscle-reading experiments desirable guides are frequently described as suggestible or temperamental, and the trait is thus interwoven with motor expansiveness or impulsion.

Is it a general trait?

The question arises with regard to suggestibility, just as it does for all other personality traits: Are we justified in discussing suggestibility in general, or should we speak only of susceptibility to a particular sort of suggestion? Does it follow, for example, that the individual who finds a wire that he holds burning his fingers because, presumably, it is being heated by an electric current will also succumb to the suggestion that two lines of equal length are not equal just because he is asked, "Which is the longer?" W. D. Scott, on the basis of his own experiments and those

of other investigators, concluded that there was no general suggestibility. Aveling and Hargreaves, on the contrary, believe that they have experimental evidence of a factor of general suggestibility, although they find it modified by specific conditions which vary in individual cases.[1]

In the experimental treatment of the subject we find Porteus including suggestibility in his social rating scale, since for mental defectives it is an outstanding trait of social inefficiency. Filter cites inaccessibility to suggestion as one phase of self-assurance, and Voelker as one aspect of trustworthiness, since sticking to your point when you know you are right is one item in general trustworthiness. Aveling and Hargreaves found no tendency for suggestibility to be correlated with other "general" factors, such as general intelligence and perseveration, but there was a slight positive correlation with "Common Sense" in its bigger meaning. The latter remark that the contra-suggestible child may appear stupid at times, and it is the author's impression that the converse is also true—that is, a suggestible child is frequently overestimated for intelligence by his teachers.

Several forms of suggestibility

Some obvious distinctions with reference to different forms of suggestibility must be kept in mind. Aveling and Hargreaves, for example, distinguish between those suggestions that are given without personal prestige, what they call depersonalized suggestibility tests, and those in which tests are given with

[1] "Suggestibility with and without Prestige in Children." *British Journal of Psychology*, Vol. 12, 1921.

personal prestige derived from the experimenter. When a "Prestige" suggestion operates, there are three possible modes of response—positive, neutral, and negative, the latter being a form of contra-suggestibility. With "Impersonal" suggestion, contra-suggestibility is not common and the distribution is approximately normal. Thus graphing the frequency distributions for different tests of suggestibility enables one to determine whether the suggestion is a "prestige" or a "depersonalized" suggestion.

Prestige and depersonalized suggestion

Another distinction that has been made is between a passive form of suggestibility growing out of lack of critical faculty and associated with a neurasthenic trend and an active form due to excessive impulsiveness with a liability to hallucinations, associated with an hysteric trend.

Binet, in an illuminating passage in *The Intelligence of the Feeble-minded* (Miss Kite's translation, page 119), speaks of docility as suggestibility of a particular form.

Intellectual suggestibility; suggestibility of character

There are, in our opinion, two forms of suggestibility which have not been sufficiently differentiated; the suggestion of hallucinations, of ideas, of concepts on the one hand, and the suggestion of acts, of words, of mimicry on the other. Docility is a suggestibility which shows itself simply in acts, words, attitudes. The fact has escaped notice that the mental conditions of the two orders of phenomena are not the same; the formation of an hallucination supposes not only a false perception, but a suspension of the critical senses; on the contrary, for the execution of a suggested act, it is not necessary to have a consistent conviction. This latter suggestion encroaches

less upon the personality. It is not the reason of the agent which bends; it is his will, his character. One may have suggestibility of character without having suggestibility of reason.

The energy with which an individual reacts to contradiction or to a questioning of his opinion or a statement he has made was used in the individual will-temperament test to reveal one phase of his temperamental make-up. This "Reaction to Contradiction" test my critics call a suggestibility test. It does test, I believe, the superficial form of suggestibility caused by compliance or deference which Binet has called docility and related to temperament. In no sense does it invoke hallucinations and it does not even follow that those subjects who adopt the suggested attitude or in the group test follow the suggested line of action are necessarily convinced. They may be merely showing deference to the examiner, complying with his request; they are not duped.

How an individual reacts to contradiction reveals temperamental make-up

In the individual test, preparation is made for contradicting the subject by asking him early in the session to choose which one of two envelopes he wishes to open. These envelopes are conspicuously labeled and are said to contain, one an easy mental test, the other a hard test. No suggestion is given as to which envelope contains which test; and as a matter of fact both envelopes contain blank sheets of paper. Toward the end of the test the examiner returns to the matter and asks the subject which envelope he chose. Whichever he names the examiner questions, at first mildly, then more forcibly, the accuracy of the sub-

ject's memory, with recourse to his own notes for confirmation of his position.

The reaction to such suggestions is a most valuable index to aggressive trends. Some subjects hasten to retract their first statement, others maintain an attitude of indifference, others are conciliatory (both examiner and subject are somehow right); still others hold to their opinion but in a mild way, accepting the burden of proof and citing reasons to prove the correctness of their statement. The most strongly aggressive individuals throw the burden of proof on the examiner and may react angrily.

Voelker, who uses this test in his first series of tests for trustworthiness, refers to it as the "M or N Test of Suggestibility" and cites it as a test of suggestibility and nothing more. Such a use of the test fails to discriminate between the aggressive value of the different forms of refusal to accept the suggestion. One may fail to take the suggestion and yet score 7, 8, 9, or 10, depending upon the form in which the refusal is put. The polite but firm reaction scored 8 is often more socially valuable than the angry flare-up of 10.

There is some question as to the proper scoring of those individuals who forget the envelope they chose (less than two per cent) and of those who suspect almost immediately the purpose of the test: "tumble," as they express it. The first appear to be of a somewhat apathetic type; and the second, on guard, aggressive.

The fact that the dictates of politeness in general

A "tactful" reaction

counsel a conciliatory or firm rather than a combative reaction is not a fair criticism of this test. To repeat: The tactful rather than the combative attitude is in many life situations the more successful, but the latter is, obviously, the more aggressive of the two. It often defeats itself by arousing antagonism and is, so far, of dubious value. But the mild individual who gives in at the least suggestion of error will never swing the world into his orbit, however pleasing he may be as a satellite.

Coaching

The contradiction test, although giving very valuable results, suffers under two or three very obvious disadvantages. In the first place it is of service only when taken at its face value, and it is a test on which coaching would be extremely easy. But the test has fair reliability, as shown by the fact that even with test-wise subjects the same procedure gave a correlational coefficient of .60 in the vocal will-temperament test. (See Chapter XV.)

Prestige and sex of examiner?

It is quite likely, also, that the prestige or personality of the examiner may have a decided effect upon the outcome. For this reason, all suggestions are given in as matter-of-fact a way and in as simple a manner as possible. I find, indeed, that my student examiners obtain about as high a percentage of retractions as I do.

Again, men reagents to whom the test has been subjected for criticism, find the sex factor potent. They insist that they would contradict a man examiner much more strenuously than they would a woman. This is quite possible, although it is evi-

dent that such moderation of impulse is somewhat dependent upon the original strength of the impulse; many men contradict women violently enough. In all mental testing, however, a sex factor operates and needs to be scrutinized.

Correlations

Reaction to contradiction has been placed with the tests for aggressiveness. It correlates slightly with speed of movement (66 per cent agreement within three places) and with interest in detail (67 per cent of agreement within three places). In its own group it correlates with resistance to opposition (69 per cent of agreement within three places); with motor impulsion (66 per cent of agreement within three places), and finality of judgment (65 per cent of agreement within three places). A firm reaction to contradiction is evidently a form of self-assertion to be expected from the forceful individual. The correlation with interest in detail indicates that carefulness in reaction may serve in some degree to motivate confidence in it. In such a case reasons will be cited for its correctness rather than an angry assertion made of its validity. (Scores 7 and 8.)

Testimony experiment in group form

In group work a testimony experiment was substituted for the contradiction test of the individual form. It is termed a Non-Compliance test, to suggest that it measures docility rather than intellectual suggestibility. In preparation for this test a list of ten words is read early in the experimental session, with the following directions:

"Listen to me. I am going to read you a list of ten words. You are to remember them so as to be

able to report on them at the end of the test. *You must also watch very carefully everything that I do while I am reading the words,* for I shall ask you questions about my actions."

The examiner reads the list of words slowly from an oblong white card. He stands while reading, holding the card in his left hand and a pencil in his right hand. He taps at every word he reads. Then, after calling attention to every item in the list of words about which a question is to be asked later, he reads the list a second time, duplicating the conditions of the first reading. Every effort is made to minimize the individual differences in observational and memorial capacity by the explicit directions concerning *what is to be* noticed, and by equalizing auditory and visual items. A report on the words remembered and on the examiner's actions is obtained at the close of the session by a false-true test. The record blank contains sixteen sentences and after each the words "false" and "true." The directions read: "If you think what a sentence says is true, draw a line under 'true'; if it is 'false,' draw a line under 'false.' If you are absolutely sure that you are right, draw two lines under 'true' or 'false.'"

When every member of the group has finished marking every sentence, the following suggestion is given: "Of the sentences you have just marked, eight are false, eight are true. You may correct your work in this way: Draw a circle around any 'true' or 'false' that you made a mistake in marking, and underline the other word instead. You may

make all the corrections you care to, so as to mark eight false and eight true."

Since all the statements are true, it is possible to score the degree of compliance by the ratio between the number of changes made and the number of changes necessary for complete acquiescence to the suggestion that eight of the statements are false and eight are true.

A system of weighting is also introduced by use of the double underscores and by obtaining the relative difficulty in marking the different statements, all of which details will be found in the manual for group testing.

The group test differs in a number of ways from the individual test. It is possible to score it in a purely objective manner, and the author believes that it overcomes whatever of prestige from the individual examiner is found in the individual test. Aveling and Hargreaves, who included in their investigation of suggestibility a testimony test in which suggestive questions were asked, concluded from the normal distribution curve of results that the suggestion under such conditions was not a prestige suggestion. My results suggest the same conclusion. There is almost no evidence of contra-suggestion operating—one of the indications of a prestige suggestion—which would have led to changes from "false" to "true" instead of from "true" to "false." Moreover, the distribution of cases does not appear to change with the examiner, although my records on this point are less extensive than I would wish.

Group test less effective than individual test

But while technically this test might be thought a more satisfactory one than the "Reaction to Contradiction" of the individual series, just because it lacks the personal contact of the individual form it is a much less effective test of personal aggressiveness. It encourages an intellectual balancing of reasons rather than the immediate characteristic reactions of the individual test. Only occasionally does an examinee flare up sufficiently to write such comments as "You're crazy," "I don't believe you," and the like.

III. RESISTANCE TO OPPOSITION

Resistance to opposition tested by blocking the movements of writer's pencil

The highly characteristic reactions that appeared in muscle-reading when the pathway which a blindfolded guide was following was blocked so that the "mind-reader" was unable to get through led me to introduce this test. (See page 54.) Unfortunately no adaptation of it for group-testing was possible. As a substitute for it norms were obtained for the number of times "false" or "true" was doubly underlined in Group Test XI. This substitute is not a very satisfactory one, as it correlates only to a slight extent with the other items in its group.

As given in the individual form of the will-temperament test, resistance to opposition is measured by asking the subject to write his name with his eyes closed and then, after the movement is well established, blocking the pencil point with a small box. The reactions that occur are quite as characteristic as those found in muscle-reading when movement is

checked. The bold, insistent pressure exerted by some subjects is in amazing contrast to the utter passivity shown by others. Between these extremes fall intermediate reactions, that of quick, energetic dodging of opposition or gentle but persistent pressure. Fully to appreciate the many subtle possibilities in the way of reaction to the test one should give it to a number of people.

Two reactions occur that cause some uncertainty in scoring. In one case the subject believes that the examiner is pushing the pen-point down and he simply acquiesces by writing down. On the face of it, it is difficult to distinguish between this acquiescent reaction and a dodging reaction which is really much more aggressive. The former, however, exhibits gentle pressure and a mild, continuous movement. The second difficulty is a real one. Some subjects are at first baffled, nonplused, bewildered by the situation, but develop great energy in resistance as soon as they recover from their perplexity. A second trial with such reagents results in very strong resistance to opposition. They belong to the slow, cautious, obstructed type who readjust slowly. All things considered, it seems best to grade this reaction 4, if urging is required to get the subject to continue, although the amount of resistance eventually engendered is much more pronounced than holds for subjects who score 5.

The introduction of a second trial was made in order to estimate the effect of the confusion attendant upon an unexpected opposition. The slow individual

mentioned above after adjustment develops great resistance and would score distinctly higher on a second test.

Individuals of great determination score high on this test. Not only is there great pressure exerted, but in consequence of the opposition, writing becomes larger, firmer, heavier, with no evidence of a tendency to compromise because of the difficulty encountered. A famous woman-leader of the feminist movement, when her pen encountered the obstacle, exclaimed at once, "Get out of my way!" a suggestion enforced by the great counter-pressure immediately exerted. Male subjects have frequently indulged in still stronger expletives. Psychopathic subjects and delinquents show, on the contrary, great reluctance in pushing on, even when urged repeatedly to do so. They show complete passivity in the face of opposition, a tendency to give up completely.

Correlations

The scatter-diagrams show some interesting relationships. Resistance is positively correlated with speed of decision and with freedom from load in the speed group of traits (67 and 65 percentage agreement within three places). In the case of the first-named trait the positive relationship is strikingly evident for the highest and lowest scores on resistance. With reaction to contradiction, resistance to opposition gives a high positive correlation. With the third group of items, resistance correlates positively with motor inhibition (67 per cent of agreement within three places).

It is particularly interesting to note that whereas

reaction to contradiction correlates more particularly with motor impulsion, resistance correlates with motor inhibition. This agrees with the examiner's observation that the mobile, rapid-fire type of person is apt to be "assured" or self-confident in asserting an opinion rather than stubborn in holding it. The deliberate, careful type, on the contrary, assert their opinion more diffidently but hold to it more tenaciously.

The positive relationship found to exist between speed of decision and resistance was unexpected. I do not think, however, that the reason for it is obscure. Obviously, one factor in a quick counter to opposition is a speedy recognition of just what the situation is. I have noted in another connection that members of one of my groups showed very great force in resistance as soon as they had adjusted themselves to the situation. At first they were confused, "fussed"; they are slow-reacting, somewhat inhibited, assured individuals, but just the people whom we know to be excessively obstinate when once they are "set." Possibly they are penalized too greatly by the present method of scoring.

IV. FINALITY OF JUDGMENT

Many persons reconsider a judgment once passed

The need of testing for this trait was impressed upon the author by noting how many subjects in the will-temperament test showed a tendency to return again and again to a reconsideration of the judgments they had passed in Test I, long after they had left this test and were engaged on others.

It seems evident that such a tendency to revise a decision once given would be of considerable practical significance in everyday life. In executive positions or situations in which a decision once formulated touches off a series of activities, as in acrobatic stunts, continual revision of decisions once passed would be fatal to efficiency or even to life. Under such conditions it is necessary "to think things through" the first time and to abide by one's judgment. On the other hand, in formulation of a philosophy of life, a scientific hypothesis, or a character-analysis, what one may describe as the spiral method of reaching a decision has some value, since it insures seeing a conclusion from all sides, the reasons both pro and con.

Finality of judgment scored by asking a subject to recheck judgments

As a test of finality of judgment, the simple device was used of asking a subject at the close of the will-temperament test to return to Test I and make any changes he cared to in the way he had previously checked it. His score was determined by the amount of time spent in revision and a record was kept of the changes made.

Many variations in reactions

This test is grouped with those that measure force of temperament, since the maintenance of a position once assumed seems allied to self-assurance and decisiveness and since it evidently characterizes those individuals known to be aggressive and forceful. The latter frequently dismissed curtly the suggestion that they recheck the judgments they had passed in Test I by saying, "No, I did that once"; "I did my best the first time"; "I shouldn't improve any by

reopening the matter." Others in the interest of accuracy respond to the suggestion of revision by running rapidly over the list and checking their judgments, rather than remaking them. Others reopen every question and may consume as much time in revision as in the original checking of traits.

Among the subjects tested the most striking consumption of time spent on revision was made by a man referred to the examiner as showing this trait to such excess that it hindered in many practical situations. In running a car, for example, it is said that he balances the advantages and disadvantages of shifting gears so long that by the time he makes up his mind the opportunity for shifting may be over.

"Waverers" constitute a variety of folk, who in the routine of daily life hamper its smooth running. Now they "think they will," and a moment later "think they won't." Words with two possible spellings or two possible pronunciations keep them jumping from one to the other; so too their friends' treatment of them keeps them speculating, with consequent fluctuation in their own reactions. As likely as not a change in impulse or a trivial circumstance determines their final decision. It is probable that in positions of responsibility even a slight measure of irresolution may lead to the charge of insincerity which so often tarnishes the reputation of an otherwise great man.

Correlations

The scatter-diagrams show a slight positive correlation with speed of decision and speed of movement (agreement, within three places, of 65 per cent

against a chance agreement of 58 per cent). An inspection of the *high* and *low* scores for this trait and for speed of decision shows very definitely that those who make up their minds most quickly in the first place are those who are inclined to keep them "made up," while those who debate a matter longest in the first instance usually take most time in revision when given a second chance. One occasionally finds an individual who checks his character traits at good speed but spends an excessive amount of time in revision. In life he *is slow* in making up his mind except under such pressure as that furnished by a test or an emergency. A negative correlation is indicated with volitional perseveration and motor inhibition (a 30 per cent disagreement of six or more points against a 20 per cent chance disagreement) and a slighter negative correlation with interest in detail. The highest positive correlation occurs with motor impulsion, 74 per cent agreement within three places as against a chance agreement of 58. With reaction to contradiction, there is a 65 per cent agreement. Finality of judgment is thus found (as the examiner thought probable from studying the make-up of subjects) to correlate positively with the aggressive and speed items; negatively with interest in detail, motor inhibition, and volitional perseveration.

Scoring of finality of judgment should be revised

One possible improvement in scoring may be mentioned here, namely, the weighting of the time-score by the number of changes in judgment. In the published scoring no attention has been given to this

feature of the subject's reactions. The same modification in scoring is suggested for the group test and, in addition, a more important correction, namely, scoring on the *ratio* between the *time* spent on revision and the *number* of decisions made in Test I rather than on the flat time. Since a time limit is set for checking character traits in the group test, some subjects have much more material than others to review when the question is reopened at the close of the hour. In spite of this discrepancy in the conditions of the individual and the group test, Meier found a positive correlation of .65 between the individual and the group results.

CHAPTER NINE

Tests for Carefulness and Persistence of Reaction

I. MOTOR INHIBITION

THE power to hold back a motor discharge, to keep an impulse under control, to achieve a purpose *slowly*, is undoubtedly a factor in many kinds of success. All who excel in motor activities possess this quality to a high degree. It is essential to the sportsman, the surgeon, the skilled craftsman, the singer. In social life it shows itself in capacity to refrain from speaking under provocation, in the maintenance of reserve and imperturbability.

Retarded writing used to measure capacity to hold back motor discharge

In the will-temperament test, such power of motor inhibition was measured by the length of time the writing of the given phrase "United States of America" could be voluntarily retarded. In order to insure comprehension of the test, a preliminary test was used to give practice in it. To supply a motive for effort, a high record was cited and emphasis used to establish a strong "mental set."

Individual variation in this test is extreme, ranging from a retardation of a few seconds only to a retardation of *three-quarters of an hour*. The test in the individual form is very time-consuming. In the group form of the test this difficulty is overcome by

limiting the time spent on the test and scoring from the number of scrolls traced in that time; the fewer the the scrolls or parts of scrolls the higher the score. The time limit in the group form reduces the delicacy of the test for those who would make the very high records in the individual test. That a difference in capacity to retard movement actually taps some fundamental difference in make-up is obvious from observation of individuals while at work and their subsequent comments. For some the task is amazingly disagreeable, they assert the impossibility of prolonging the retardation to any extent. Others insist that they could retard indefinitely if their lives depended upon it, but that life's too short to make it worth while as a reaction to a mere test! Others, anxious to make a good record, have recourse to certain devices by means of which attention may be diverted from the hand, such as carrying on a conversation with the experimenter. An interesting index to the degree of tension experienced by many reagents is found in their great overestimation of the length of time that they had retarded their writing. Sometimes a retardation of a few seconds was guessed to have been one of two or three minutes.

A "strain on the nerves"

One woman who maintained her control long enough to achieve a 10 score finished on the verge of hysterics; another was badly nauseated. For both of these subjects the motive to score high was very strong. In the following paragraph I give an introspective account of his reaction to the test written by a successful football player (Mr. Fred Layman,

later Oxford Scholar from Wyoming), who made one of the excessively high records:

Report from football player

Before beginning the test of retarded writing I was told that C. had taken seventeen minutes for the task; my purpose was to equal that record or exceed it by a little. I likened the point of my pen to the hands of a clock, and my purpose was to move the point so slowly as to be just discernible. Next point was to convince my mind as to the amount of time that had passed. It is customary in time of strain or anxiety to believe a minute to be an hour and I attempted to believe the opposite, that an hour was a minute. This enabled me to keep better control over my impulses.

The fatigue was great, yet it was not the thing that bothered. The greatest factor was my nerves and they were the hardest to control. The strain on them was not steady but came at periods. I don't remember how many periods but I think about two or three, each succeeding one being stronger than the one just past. The impulse aroused was to jump up, throw the pen across the room and leave everything. It seemed maddening to persist in continuing the same slow movement without change but somehow I succeeded. After each climax when my nerves calmed down it was very easy and required little effort to keep the pen moving at the snail pace.

I think I remember observing a slight increase in speed on the last few letters of "America." I recognized the tendency to hurry in nearing the completion of a task. So I attempted to proceed even more slowly but only partially succeeded. I suspected the time after finishing to be about twenty or twenty-one minutes and was somewhat surprised to find it to be about twenty-nine minutes. . . . I'd choose anything else rather than go through the same experience again.

Power of motor control is pretty thoroughly tested by this reaction. This conclusion is confirmed by the fact that an age factor operates very decidedly at both extremes of life, since adolescents and those declining ever so slightly from the climax of maturity show lowered scores. Sex also operates in determining score; seventy per cent of the men examined equal or exceed the median record made by the women, when no time limit is set as in the individual test. Group-testing erases this differentiation.

Young and old people find it hard to retard writing-movements

Women inferior to men

The sources of error that need to be guarded against are failure to establish a strong motive for success and the effect of practice on retardation of writing. The author gave a long practice series to a group of subjects and found that the third trial of the series correlates most highly both with the average of the whole series and with the final trial. In the final revision of the will-temperament test, three trials in retarded writing are, therefore, included unless either of the first two trials deserves a score of 10.

Practice increases capacity

In the norms presented for the individual will-temperament test, those for the third trial on retarded writing have been less accurately standardized than those for the first trial. In getting the former I have simply converted into time-values the records found to hold for the third trial in group-testing. The method used in group-testing obviates the fatigue that occurred in the other form of the test and can if desired be substituted for it. As previously suggested, it is much less time-consuming. It has al-

ready been stated that both an age and a sex factor determine to some extent the score one makes on motor inhibition. The norms given for the first trial in the individual form of the test are somewhat vitiated by the fact that nearly two-thirds of my subjects were women under 35 years of age. It would not be difficult to establish separate norms for the two sexes for this test and to apply different norms for different age-groups.

The point of greatest interest is whether a real temperamental difference is tapped by the varying facility with which the two sexes and various age-groups succeed in this test. Woman has always in popular psychology been described as effervescent in contrast to man and the same characteristic has been attributed to children and adolescents. It may be that the outcome on the present test substantiates such a view. The question of the possible change in temperamental pattern with the growing loss of motor inhibition as one declines from the climax of maturity is quite as interesting. Loss of motor skill, increased talkativeness, and disinclination for contests that involve strain are characteristics of age. One wonders whether in the test on retarded writing one finds a delicate indicator of the approach of certain old-age characteristics.

An occasional subject able to retard writing without signs of tension

Another outstanding difficulty in scoring the record on retarded writing must now be considered. An occasional individual succeeds in making a score of 10 without the slightest evidence of tension or effort. An inspection of the writing produced under such

circumstances suggests what has happened. The writing is large and light and shows other features that characterize automatic writing (see page 57). It is quite unlike the small, heavy, tense writing that is the more usual outcome of retardation of movement. What has happened, of course, is that the subject's attention has wandered from writing. He has established a mental set to write slowly and then turned the task over to his hand while he thinks of other things.

Many subjects show an inclination to keep attention from handwriting movements (which is the cause of the muscular tension) by talking to the examiner or in other ways distracting attention from writing. Frequently this distraction of attention is evident in the increased size and rapidity of writing during this period of distraction. The small group referred to in the preceding paragraph manages the distraction without an increase in speed of movement. Such a *tour de force* is most interesting. It is achieved by a most colorful and interesting type of person, the only type that succeeds in scoring 10 on both motor impulsion and motor inhibition. Such persons are strongly of the fluidic or mobile type of temperament but with power of sustained accomplishment that is due to automatic tendencies. Possibly the requirement that retarded writing be restricted in size would check the operation of such automatism, but the author is not confident of the effectiveness of such instruction in all cases. One of my assistants insists that with the slightest relaxation of muscular tension

—which can be told by watching the muscles—the examinee's attention should be recalled to the movement.

Inhibition may result from several physiological conditions

From the physiological side, motor inhibition as well as motor impulsion must be recognized as variously caused. No doubt the two are inversely conditioned in certain respects. Complication of pathways of nervous discharge on either the impressive or expressive side would lead to obstructed activities. Reduced permeability of synapses possibly, or absence of chemical excitants that make for impulsion, would function as inhibitory forces, although in this second sense inhibition would be a negative rather than a positive thing and would give us James's type of personality obstructed because of deficient impulsion rather than because of exaggerated inhibition.

What type of inhibition is tapped by the test on retarded writing? Evidently positive inhibition due to complication on the expressive side, the tendency for the motor discharge to take place at the normal rate for writing being blocked by the establishment of a "set" for a different rate of discharge. Conflict is set up between a habit and a "goal-idea," with varied outcome in the case of varying types of organization. Power to check the discharge of one impulse through enforcing another impulse is perfectly compatible with both impulses being strong. It is possible for one to score high on both inhibition and impulsion.

Motor inhibition found with or without motor impulsion

The diagrams give no certain indication of either positive or negative correlation of these two traits. But study of specific groups indicates that subjects

scoring 9 or 10 in the individual test for inhibition rarely score over 5 for motor impulsion. The reverse is not true; a low score on inhibition does not mean a high score on impulsion. There are, actually, four possibilities of combination. A subject may score high on both traits; low on both; or high on one and low on the other. Varying combinations of scores are, I believe, of great significance. A low score on both traits characterizes a rather definitely relaxed and unresistant individual; a high score for impulsion with a low one for inhibition, the explosive or impetuous person; a high score for inhibition and a low one for impulsion, the deliberate, or, even, the obstructed type; a high score on both, the vigorous, forceful personality. But, to repeat, in this latter group I find, again, two divisions, as revealed by the type of writing produced under instructions to retard movement to the greatest possible degree. For some, this writing shows signs of great tension; for others, not, a fact which gives evidence of very different types of reaction as shown in preceding paragraph.

Normal handwriting reveals impulsive and inhibitory tendencies

I believe that to a very considerable extent it is possible to discover the four types of reaction mentioned above in characteristics of the normal hand. This possibility gives experimental confirmation to a conjecture of mine,—made elsewhere [1]—that the concepts of motor impulsion and motor inhibition offer us our best tools for graphological analysis of writing.

[1] *Graphology and the Psychology of Handwriting,* pages 123 ff.

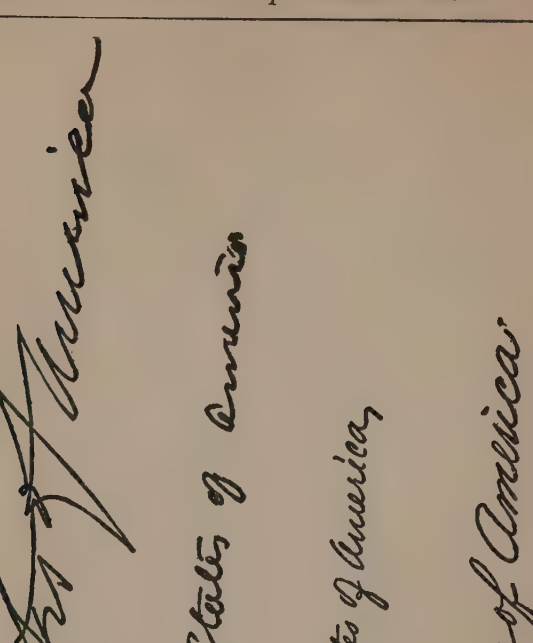


FIG. 8

1. Written by an individual scoring high on both motor impulsion and motor inhibition.
2. Written by an individual scoring high on motor inhibition, low on motor impulsion.
3. The hand of a subject scoring high on motor impulsion, low on motor inhibition.
4. The hand of a subject scoring low on both motor impulsion and motor inhibition.

Figure 8 gives us a sample of handwriting characteristic of each of the four classes.[1]

1. The hand of the individual high both in control and impulsion is a highly individualized but rapid hand.

2. The hand produced by a penman low on impulsion, high on inhibition, gives evidence of tension in its excess of pressure, in its cramped or even crabbed forms, or in its small size.

3. The hand high on impulsion but low in inhibition is rapid, light, fluent.

4. A penman deficient in both impulsion and inhibition writes a characterless relaxed hand.

Unfortunately, line-quality is not well preserved in a reproduction.

Correlations

So far as the other tests of the will-temperament are concerned, motor inhibition shows no tendency to correlate with the speed items. It correlates positively with two of the aggressive traits, reaction to contradiction and resistance to opposition, more highly with the latter than with the former; the percentage of agreement within three places being 66 in the first case and 71 in the latter. In its own group it gives a high positive correlation with inter-

[1] Hands 1 and 2 were chosen for the scale (Models for Imitation) as samples of the writing of individuals known to be explosive and deliberate, respectively. At the time of choice neither individual had been given the Will-Profile Test. When, later, the records were taken my expectations were confirmed to the highest degree. Hand 1 is written by a penman who maintains an automatic set for retarded writing. Individuals of hyperkinetic make-up whose retarded writing shows tension write a much more highly controlled hand.

est in detail (77 per cent agreement within three places), and a slight positive correlation with coordination of impulses (65 per cent agreement within three places).

The man or woman who scores high on this test is, in general, a somewhat obstinate, careful individual, who may or may not possess "drive." He is a man whose motor control is shown in games demanding delay in movement, patient waiting. He is the man who can sing "pianissimo" as well as "fortissimo"; he awaits quietly his cue for entrance into a conversation or into an orchestral ensemble.

Those who score low are lacking in these qualities. It will be shown subsequently, in Chapter XIII, that patients suffering from mental disorders rarely show much capacity for motor inhibition, and that psychopathic personalities with a history of sex delinquencies make a particularly low score. It is possible that the test is valuable in determination of the general nervous condition and could be so used.

In everyday life those scoring very low are a "nerveless," indifferent type of person, if motor impulsion is also low; or an uncontrolled, flighty type, if motor impulsion scores high. A subject of the latter type volunteered the information that she found retarding her writing as impossible as playing a violin in an orchestra. When she tried orchestral playing she invariably discovered herself getting ahead of the other musicians! She reported also that she was under treatment for a toxic goiter.

II. INTEREST IN DETAIL

Interest in detail

The degree to which this trait is present in an individual constitutes a most important factor in his make-up. In one person an interest in detail is so obsessive as to blind him to all else. He cannot see the forest for the trees. By another, details are handled with great impatience. Only under pressure of excessive training or determination to achieve a certain end can he hold himself down in contemplation of details. Such habits of exactness as are painfully acquired do not carry over to other situations. He is, candidly, bored to irritation by details and, frequently, bored to death by the painfully exact individual. He prefers, as he states it, "to take things in big." "Please, please," exclaims Jack London, as quoted by his wife, "know that I carry only general principles in my head and do not carry details."

As a practical matter it is important that individuals with a great interest in detail and those with a slight interest be properly placed vocationally. The secretary should take pleasure in the filing of material; in the production of beautiful pages of type; in deciding whether to substitute a semicolon for a comma. Her chief should as thoroughly enjoy turning over these details to her care!

Not equivalent to logical keenness

General interest in detail should not be confused with intellectual keenness or logical penetration. This latter is a matter of intelligence level; while interest in detail may exist both with and without intellectual acumen. In the latter case we get the

individual swamped by details, unable to make any selection for practical purposes; in the former we may get the exact scientist or the philologist.

Measured by exactness in imitation and time spent in copying a model

In the will-temperament test interest in detail is measured by the exactness with which a model is imitated when instructions are given to copy it as exactly as possible; the accuracy with which a second model is copied when only general instructions are given; and by the relative times consumed on a rapid and an exact imitation.

It was stated under the discussion of "flexibility" (page 97) that a native "mental set" toward speed or accuracy operates so strongly that unless an "experimental" set toward the one or the other is established by the directions given the subject the resulting imitations are not strictly comparable; they measure different traits. By asking for a rapid imitation and for an exact one, the investigator gets not only a careful imitation that can be scored for accuracy of detail and serve as part measure for scoring this trait, but also, in the time-difference between the rapid and the slow imitation, a measure of the subject's willingness to spend time on details, and the care with which he follows the experimenter's instructions.

There are a few cases of excessive interest in detail in which the instructions to speed do not avail to produce a rapid imitation; an unduly long time is taken for even a *speedy* imitation of the model. Such subjects make low scores for flexibility but are given extra points on care for detail.

The scatter-diagrams indicate that interest in detail is negatively correlated with all the speed items, except flexibility. The percentage of agreement, within three places, runs 48, 46, and 50 as against a chance agreement of 58. With flexibility, on the contrary, there is a 73 per cent agreement. With the aggressive traits there is a positive correlation with reaction to contradiction (68 per cent agreement within three places) and a negative correlation with motor impulsion and finality of judgment. There is positive correlation with all the items in its own group, highest with motor inhibition, where there is 74 per cent agreement as against a 58 per cent chance agreement. The negative correlation of interest in detail with motor impulsion and its positive correlation with motor inhibition indicates that an accuracy-set is, in fact, one form assumed by the inhibitory consciousness. **Correlations**

In the Carnegie adaptation of this test there is found a high positive correlation with motor inhibition and a negative with all the three speed items, speed of movement, freedom from load, *and flexibility*.

In daily life we find friends greatly interested in detail or the reverse. The former mind their *p's* and *q's*, are finicky about their desk-equipment, and act as though a "tipsy" stamp violated the eighteenth amendment to the Federal Constitution. One of the most "fastidious" women of my acquaintance carried her interest in detail to such an extent that she utilized a whole paper of pins whenever she dressed with **Individual variation**

particular care; she was also reported to have said that the announcement of the death of a near relative couched in ungrammatical terms would cause horror first and grief afterwards! We have all heard of the housekeeper who scrubbed the lumps of coal in the coal-bin as part of the spring house-cleaning!

At the other extreme are those individuals whose drawers are filled with scrambled contents, whose purses and pockets are a chaos of miscellanies.[1] They cook by impressionistic recipes—a bit of this and a dab of that—a lost button is not listed as a catastrophe nor a misspelled word as a disgrace.

Executives who plan big programs of work, but leave the performance to others, men who work with ideas, rather than with their hands, might score low; engineers, and experimentalists dependent upon a delicate technique, should score high.

III. COORDINATION OF IMPULSES

Complex situations

Competency in everyday activities frequently involves handling a complex situation without confusion. It seemed profitable, therefore, to introduce in the will-temperament test one that measured a person's success in handling a problem that involved a double-mental-set.

Coördination of impulses measured by degree of success in writing in narrow space at top-speed

The test employed for the individual form was requesting the examinee to write "United States of America" on a very short line at top-speed. The results are scored with reference to the degree of

[1] An accumulation of trash in drawers and attics may, of course, result from excessive interest in detail. Each scrap of paper is saved on the chance that it may be needed later.

success as measured by the number of letters on the line and the approximation to the examinee's highest rate of speed. The group test is less satisfactory, since it scores on a flat performance in a given time without reference to the examinee's own speed limit. The situation involves a conflict or interference of motor impulses somewhat similar to that which has been reported upon by Roback.[1] Quite possibly those who fail in the will-temperament test represent the same types he reports, namely, the "confusers" and "omitters." The preferential "set" of confusers is for speed; of omitters, for space-accuracy.

Some subjects forget the speed requirements; others the space requirements

In the will-temperament test subjects are found who completely forget the instruction to write as rapidly as possible and bend all their energies to getting the phrase neatly on the line. Another group pays little attention to the line itself but dashes off intent on making a speed record. Between these groups are found various degrees of success in managing the double requirement.

In criticism of this test it has been urged that success is aided by writing a fine rather than a large hand. That this factor plays very little part, I am convinced. Writers of a notably minute hand often fail on the test, while writers of large hands may accommodate themselves to the small space with perfect ease. Again, size of pen has been cited as a cause of failure. But the majority of the records used in establishing the norms were written with the

[1] "The Interferences of Will-Impulses." *Psychological Review Monographs*, Vol. 25, 1917–18.

same pen, a Moore fountain pen with a fine Spencerian point.

The interesting thing about this test is the way in which it throws into the foreground the natural set of the examinee. A merely speedy person who "flies off the handle" will fail in this test, as well as the excessively deliberate person who refuses to be hurried. The first in an emergency becomes "fussed" and does the wrong thing; for example, puts the engine into reverse instead of first speed. The second keeps calm and does nothing. In a crisis that passes very quickly the latter's apparent imperturbability may actually come from failure to sense the situation quickly or from slow arousal to excitement. But among my records I find the names of a number of individuals who score as low as 3 on the test who are certainly to be relied upon to keep their heads in a crisis. They refuse to be stampeded by pressure.

There is some question as to the proper weighting of speed and accuracy in the scoring. Slightly more stress has been laid on satisfying the space requirement than the time requirement, since the sight of the line served as a constant reminder of the former.

In everyday situations that are complicated but not critical we find all varieties of skill in manipulating them. The person scoring high on this test would be quick in taking up things like learning to drive an automobile, where the handling of throttle, clutch, gear shift, and brake must all be kept in mind. The

person scoring low would require excessive practice before all factors in the situation could be manipulated.

The test on coördination of impulses has been grouped in the will-profile with the items for care and accuracy. As we shall see in the following paragraph, the proper grouping of the test is subject to question. Its outcome shows apparently a higher degree of correlation with the speed items than with those in its own group. But since it correlates also with interest in detail, it apparently does test the ability to act both quickly *and correctly*.

Correlations

The scatter-diagrams show for the individual test an agreement within three places in the scores received on flexibility and coördination of impulses of 75 per cent, where the chance agreement within such a range would be 58 per cent. This indicates a high positive correlation of these two traits. A positive correlation is also suggested with speed of movement and motor impulsion, within each case 68 per cent of agreement within three places. Interest in detail gave 69 per cent of agreement within three places.

Carnegie adaptation of test

The Carnegie adaptation of the will-temperament scale gives a high correlation of coördination of impulses with all of the speed items and a negative correlation with care for detail. But, as stated before, in group testing the scoring is on a flat time, which unduly accentuates the speed factor. Data are not yet available to determine the effects of such scoring on the author's adaptation of the test for group work.

IV. VOLITIONAL PERSEVERATION

Perseverative tendencies recognized by psychologists in a number of forms

Perseverative tendencies have attracted considerable attention in experimental psychology.

Various types of activity are included under the term perseveration, of which the main forms are the following:

(1) Persistence of sensory stimulation after the stimulus has ceased to act, which constitutes the physiological basis for the illusion of movement in the movies; or for the production of a "fiery" circle from rapidly whirling a "glowing match."

(2) The apparently spontaneous emergence of an idea after it has been some time out of mind, without a renewal of the corresponding stimulation; for example, when a tune or a jingle keeps running in one's head.

(3) The subconscious or purely physiological continuance of effects of experience which gives us what has been called "perseverating determining-tendencies," obsession, for example with a given line of work.

Individual variation

Perseveration has been, as we see from the above outline, approached from the standpoint of sensation after-effects; emergence of "free" memory ideas; and character-effects. It is known that some very striking individual differences occur with regard to the extent of perseveration in each of the three forms listed above. The rate, for example, at which the glowing match must be whirled in order to become a solid circle of fire varies from one person to another, depending upon the individual tendency

to perseveration of sensation; "fixed ideas" or recurrent tunes or memories do not disturb all men equally; "mental sets," due to deep-seated determining tendencies, are not alike potent for all. While such individual variation is established, it is not equally certain that perseveration is a general characteristic of the nervous system so that a determination of the degree of perseveration in one field may be accepted as determinative for all others. But many investigators assume that this is true and find in the tendency of nervous activity to "perseverate" or die out quickly a characteristic of such great significance as to make a classification of men into perseverators and non-perseverators one of the most important that can be devised.

Grey's machine to measure perseveration

The *Literary Digest*, a few years ago, contained an account of "A Machine That Measures Character," invented in England by John Grey and described by him in *Knowledge*, as a simple apparatus by which flashes of colored light can be thrown in rapid succession into the eye. To quote:

> The apparatus consists of a revolving mirror, the axis of which is horizontal, and which can be turned at any required speed by a handle and belt gearing. . . .
>
> The experiments of Shelford Bidwell, and of others, have shown that the sensation of a color persists for a short time after the external impulse has ceased. If the duration of this persistence is equal to the time interval between two successive impulses from the revolving mirror, the color will appear to be continuous. But if the persistence is less than the time interval, the color will appear to flicker.
>
> In order to measure the duration of the persistence in any

given person, all that is necessary is to ascertain, from the speed indicator on the axis of the mirror, the exact number of revolutions which the axis is making when the flicker disappears. . . .

The registration of the persistence of color sensation furnishes an index of an individual's perseveration, which is a fundamental factor in determining character. Says the author:

I have drawn up a scale of perseveration, and the kind of character likely to be associated with different degrees of perseveration, in the ordinary conditions of life.

At the center of the scale we have the average amount of perseveration, which is associated with the practical common sense of the average man.

When the perseveration is below the average the speed with which ideas flow through the mind is quickened, and the readiness with which the mind receives external impressions is also increased.

The first category below the average, therefore, contains persons with witty, brilliant, and suggestive minds, persons of great tact, presence of mind, and daring; all of which imply quick response to external stimuli.

To this class would belong the majority of persons who are popularly considered to be geniuses. But if we adopt Carlyle's definition of genius as "an infinite capacity for taking pains," the genius would have to be looked for in the class having perseveration one degree above the average.

The category with perseveration one degree above the average contains persons who are fond of abstract thinking, and who follow a theme into all its ramifications. They think slowly and learn slowly. The scope of their consciousness is wide, but they are not quick of apprehension because they do not respond readily to outside stimuli.

We may say, therefore, that the classes with perseveration

one degree below the average and with one degree above the average produce geniuses of different types, who, while they excel in one direction, have also certain defects associated with their excellent qualities.

When we pass to the classes of persons with perseveration two degrees above or below the average, these defects are intensified, and serious deterioration of mental character begins to appear.

The category with perseveration two degrees *below* the average contains persons who cannot keep their thoughts long on one theme; frivolous persons who are fond of superficial associations, such as punsters and cynics; persons to whom all emotions are of equal value and who are consequently of weak moral character; persons who learn anything new very quickly but superficially.

On the other hand, the category with perseveration two degrees *above* the average contains persons with quite opposite defects. The long duration of the secondary function interferes with the formation of wide associations, and renders the limited associations formed exceedingly stable and inaccessible to outside influences. This corresponds to the person with fixed ideas. . . .

So comprehensive a generalization on the basis of determination of the persistence of color sensation cannot be accepted without further proof.

Lankes's investigation

Lankes [1] as preliminary to an experimental investigation of the subject raised two questions: (1) Is Perseveration a general factor? and (2) How is Perseveration, as a peculiarity of the cognitive side of mental life, related to the "perseveration"-qualities of character; i.e., perseverance or persistency of will?

To the first question, on the basis of extensive ex-

[1] Lankes, W., "Perseveration." *British Journal of Psychology*, Vol. 7.

perimentation with all types of perseveration, Lankes gave an affirmative answer, qualified by the following statement: "The lowness of the single correlations tends to show that normally, with average, unselected subjects, this general factor, though present and operative, is not very strong."

The answer to the second question is less final. Contrary to Lankes's expectations the revealed perseveration-quality failed to correlate or correlated slightly negatively for his group of subjects with the "Perseveration-, or Persistence- or Perseverance-qualities of character and behavior," as estimated by well-qualified judges. Lankes's tentative explanation is that Persistence as tested "by the estimates of qualities of character and behavior is the result, not of nature and the native system alone, but of that and the individual's own effort and will." Will is thus conceived to be independent of perseveration, so that the self, accustomed to act from motives of reason and principle, "can modify and directly counteract its own nervous system and its innate tendency towards Perseveration or the opposite." The highest degree of persistence is found in conjunction with perseveration, but a high degree of the former may exist without the latter being extreme.

Webb,[1] as an outcome of his statistical study of "Character and Intelligence," discovered a general character factor.

[1] Webb, E., "Character and Intelligence." Monograph Supplement, *British Journal of Psychology*, Vol. 1.

"Its nature is best conceived, in the light of our present evidence, to be in some close relation to 'persistence of motives'; i. e., to depend upon the consistency of action resulting from deliberate volition; i. e., from will. It thus appears to coincide more with Ach's conception of will than with either 'perseveration or the 'secondary function.' Further evidence is necessary."

Webb's general character factor

Volitional perseveration was tested in the will-temperament test by keeping a record of the time spent in working out a disguised hand. This task measures persistence at a task when there is no objectively established end and probably succeeds in tapping a real perseverative tendency. In criticism of the test the suggestion has been made that a definite problem be proposed for solution so that the examinee may know when he has succeeded in solving it. There are two objections to this suggestion:

Perseveration measured by amount of time spent working out disguised hand

(1) One could not set a problem of any difficulty without complicating the situation by introducing an intelligence factor, which should, as far as possible, be avoided in a temperament test; and

(2) Perseveration is probably better measured by a situation which makes a subjective rather than an objective appeal.

In perseverance or persistency as shown in everyday life, outer compulsion and specific interests operate to a considerable degree both in the establishment of motives and the formation of habits. *Possibly this outside factor explains Lankes's failure to*

obtain correlation between his experimental records for perseveration and estimates of perseverance or character-stability by competent judges.

The self-ratings obtained by the author for perseverance failed to check highly with the scores on persistency in working at a disguised hand (see page 225). It was for this reason that a change was made in the name of the trait which the test was designed to cover. It measures a native tendency to "keep on working," psychic momentum, rather than perseverance or sticking at a task until a certain end is achieved. The former type of person is never "through with his work." If he has fine intelligence he makes original discoveries almost in spite of himself; with low intelligence he is continually "puttering away" without result.

Subjects of low-grade intelligence may show much perseveration

Many low-grade or immature subjects, in the will-temperament test, write on and on with little evidence of success in getting a disguise. Stereotypy, or the tendency to keep doing exactly the same thing, showed in the production of one bit of writing exactly like the preceding. A second perseverative reaction appeared in the form either of a deliberate ingenuity in trying out a multiplicity of disguises or else an obsession by one particular goal-idea with gradual approximation to an inner conception. This latter form of the reaction was beautifully illustrated by the endeavor of an eminent neurologist to disguise his hand by the assumption of a pathological tremor, an interest which quite banished from his mind any sense of the lapse of time.

I am strongly inclined to the opinion that the test reveals a tendency toward self-directed activity motivated by an inner rather than an outer compulsion and hence measures a really significant trait.

Correlations

A study of the scatter-diagrams shows that volitional perseveration is negatively correlated with speed of movement and speed of decision. This agrees with Lankes's finding "that the perseverator on the whole tends to be slower than the non-perseverator." The author expected to find also a negative correlation with freedom from load, but the results give no indication of either positive or negative relationship. With the aggressive group of traits there is evidence of slight positive correlation with both reaction to contradiction and resistance (67 and 64 per cent agreement within three places); and evidence that with a very high score for motor impulsion, perseveration is low; but that perseverators may possess high motor impulsion. With finality of judgment there is negative correlation. In its own group of traits, volitional perseveration correlates highly with interest in detail (72 per cent agreement within three places).

CHAPTER TEN

Extension and Modification of Temperamental Testing

Extension of temperamental testing

INTENSIVE work on the will-temperament tests and the literature on character-testing that has appeared within the last year or so suggest that an extension of the will-profile will be desirable within a short time. There are a number of personality tests which should be added to those now included in the scale, since they belong rightfully with those that determine the dynamic level. Three in particular will be briefly described here, although no attempt has been made to standardize them. The three tests referred to are:

(1) A test for variability of reaction;
(2) A test for emotional stability;
(3) A test for self-evaluation.

A test for variability was included among the military tests for aviators. Here the coefficient of variability was found from reaction-time tests in which the candidate reacted to a visual or auditory stimulus by pressing a key. In one report,[1] quoted by Dockeray and Isaacs, occurs the following sum-

[1] "Psychological Research in Aviation in Italy, France, England, and the American Expeditionary Forces." *Comparative Psychology*, Vol. 1, 1921.

mary of results obtained in cases of nervous exhaustion from service at the front:

> Two fundamental types appeared from these tests: the type who slow up (exhaustion and weakness), and the opposite type (excitability and instability). A study of the individual reactions shows that the first type is characterized by a consistently long reaction time, 0.220 to 0.230 second with the visual stimulus; the second type presents a lower reaction time, 0.150 to 0.190 second, but an increased variability.

Variability of reaction

In the will-temperament test variability could probably be measured by the simple device of increasing the number of trials for testing speed of writing from two to ten and calculating the average deviation in speed from the mean speed. Such an addition would not increase greatly the time for giving the will-temperament test and might add a valuable item to it.

Emotional stability

A test for emotional stability was another test given by certain examiners to aviation candidates. The "line drawing and noise test," as it was called, is also described by Dockeray and Isaacs, who quote from a correspondence with Professor Spearman:[1]

> The candidate is asked to draw a line lightly and deliberately across the greater length of a sheet of foolscap, parallel to the border, with a leaded pencil, without the hand or arm touching the paper. The presence and degree of tremor can be seen, especially if a magnifying glass is used. He is then asked to draw another line in the same way; while he is doing so, an unexpected loud noise is

[1] *Loc. cit.*, pages 131 ff.

made close to the ear with a Dalby's "clacker," which makes a loud noise and is easily manipulated and hidden. A perfectly sound man will often continue the line without interruption, or a slight irregularity will appear in the line before it is again firmly continued. The effect on a nervous man is either to produce a sudden dash and a complete stop, or the line is continued in an increasingly irregular and shaky manner. He is then asked to draw a third line, after being warned that the noise will be made at some point. If the nervousness is under control, the line will not be interrupted; if not, the same hurried dash and complete stop is again seen or the rest of the line is drawn with increased tremor and irregularity.

Self-evaluation

I am not sure that this test could in this form be utilized in group-testing but it can be introduced just as it stands into the individual test for will-temperament. Possibly the tremor so often evident in retarded writing could be utilized in scoring on emotional stability.

A number of investigators have suggested the need in personality work of an index of self-evaluation. Allport and Allport (see page 44) in their measurement of personality traits found to what extent their subjects over- or under-estimated their intelligence by comparing a self-rating with one obtained by application of a standard intelligence test.

Filter [1] has suggested an interesting experimental procedure in measuring tendencies toward over- or under-estimation of self-capacity in specific situations. Two tests are cited:

[1] "An Experimental Study of Character Traits." *Journal of Applied Psychology*, Vol. 5, 1921.

Test No. 1. STRING FIGURES. (Photographs from Caroline Furness Jayne's book, *String Figures.* Charles Scribner's Sons, 1906.)

Preliminary: Task was to reproduce with loop of string on fingers patterns shown clear and traceable on pictures. Three patterns, a very simple one and two of representative complexity, were tried, and Subject informed regarding the amount of time he needed for each.

Test Question: Showing S [Subject] ten more, one at a time, ask: "Which ones of these do you feel sure you would be able to do if allowed 4 minutes for each?" Criterion of Self-Assurance: Number chosen plus number over-estimated (as shown by actual performance tested later).

Test No. 2. DECOUPAGE. (Binet's test extended.) Preliminary: Task was to "Draw what the folded and torn paper looks like opened up." Three different patterns tried, the original Binet and two other simple ones. Subject allowed to compare his drawings with the actual pattern.

Test Question: Ten more are folded and torn, and S asked after each one: "Could you do this one correctly, if you were to see it folded once more later, just before drawing it?"

Criterion: Number chosen plus number over-estimated.

Filter's tests have obviously no possibility for group-testing unless modified to a considerable extent. Allport and Allport's self-evaluation for intelligence is usable in a group test for temperament, if an intelligence rating is at hand—as it usually is in these days of much testing.

Plotting one's own profile

As it stands the will-profile itself suggests a very simple way of obtaining an index for self-evaluation. At the close of the test each examinee might be asked

to plot his own profile on the record-blank and the disparity between his self-rating and that obtained by actual test be calculated. The difficulty in including this test at the present time is that one does not know how much reliance to place upon the test-scores. This method of self-rating was used in an attempt to gauge the accuracy of the will-temperament scores and will be described more fully in Chapter XIV.

Another possibility that suggests itself as a test for self-evaluation is to utilize a subject's checking of certain of his own traits (speed of decision test) in comparison with the scores he makes on the tests.

The following pairs in the individual form of the test are usable: Careful-Careless; Impulsive-Inhibited; Self-confident-Self-distrustful; Hasty-Deliberate; Quick-Slow; Aggressive-Not Aggressive. If it should seem desirable it would be possible to introduce into the list of traits others that are scored in the test.

Test for Self-Consciousness

The Carnegie adaptation of the Downey Will-Temperament Tests contains a test for Self-Consciousness devised by Dr. M. J. Ream,[1] which, as stated in Chapter VII, is a valuable addition to the series. By having the list of character-traits checked twice Ream is able to use the difference in time as a measure of the self-consciousness aroused by the task. His directions for the first checking run, "Check the *one* trait in each pair which is the *better* in most circumstances." His directions for the second checking are,

[1] "Group Will-Temperament Tests." *Journal of Educational Psychology*, Vol. 13, 1922.

in part, "Check the *one* trait in each pair which describes *you* better." To quote:

> A number of persons otherwise quite rapid in their reactions, show considerable blocking when checking these personal traits. The test is intended to measure ease and rapidity of decision in subjective items, and the tendency not to be critical. To throw this tendency into greater relief the score on this part is compared with the score made on Part 3 [see directions above] and a ratio computed. The score thus determined is treated as a measure of self-consciousness, on the thesis that the highly self-conscious individual will be proportionately slower in making subjective, personal judgments than in making non-personal decisions.

The shifty eye; lack of aggressiveness

In considering possible extensions of temperamental testing Moore and Gilliland's experiment on "The Measurement of Aggressiveness"[1] should receive careful attention. The authors define aggressiveness as personal force, initiative, assurance, and they suggest a combination of tests, including an association test in which the stimulus words are "enterprise," "success," "company," "danger," and "death"; behavior in three distraction tests; and the eye-control test. This latter test was suggested by the common notion that the shifty eye is a sign of dishonesty or of personal weakness. Twenty-six subjects were chosen by a rating system so as to include the thirteen most aggressive and the thirteen least aggressive members of a class of eighty-nine men. Each man was then asked to perform a number of mental addi-

[1] *Journal of Applied Psychology*, Vol. 5, 1921.

tions while constantly returning the fixed gaze of the instructor who sat facing him. He was told under no circumstances to let his gaze wander from that of the examiner, as each movement affected his score. A total of seventy-two movements was recorded against the least aggressive as compared with six against the most aggressive men. The investigators conclude that a shifty eye is almost invariably accompanied by lack of aggressiveness, although possibly the steady eye does not always guarantee the presence of aggressiveness. "The correspondence is in fact so close as to justify the generalization that a stop watch and a pair of fixed eyes are the only indispensable laboratory equipment necessary in estimating roughly the force of aggressiveness in at least four-fifths of the subjects."

This eye-evasion test is of great interest from both a theoretical and a practical standpoint. In order to determine its usableness in a series of tests the author tried it out on thirteen subjects who had previously been given the group will-temperament test. It is adapted for individual testing only and although it does not consume much time in itself it requires for each subject an hour or more of preliminary practice in mental adding, a necessity which limits somewhat the practical value of the test. I found, moreover, some difficulty in interpreting the meaning of eye-movement. Were all shifts in fixation to be counted as such? All cases of blinking? All narrowing of the eyes?

A letter from Dr. Moore furnishes additional information:

> I have not counted as eye movements any shifts or blinkings that did not appear to be clear cases of evasion. Any purely reflex behavior of the eye such as might have taken place while the subject was staring at a word, was excluded from the count.
>
> This necessarily leaves a certain margin of interpretation, but we found that nearly all of the cases were reasonably clear, if the experimenter confined himself to the question of evasion. When the subject showed any inclination to continue looking away, or to adopt a method of focus that obviated a frank return of the interviewer's gaze, the experiment was at once stopped, and he was instructed that he was completely failing to meet the requirements of the test.
>
> In general, the only movements counted were fairly gross ones—a clear turning away, lowering, raising, or closing of the eyes. I believe that the count on such movements is better calculated to indicate personal traits as distinct from mere optical peculiarities. The grosser the movement is, the more certainly it is of diagnostic value.

For the subjects whom the author tried out on the eye-test, a comparison was made of the number of gross eye-movements and the total score on the aggressive traits of the will-profile. Ten of the thirteen subjects showed agreement in classification by the two tests; five were high in both, five were low. For the other three, the results were discrepant. One examinee who ran high on the Downey tests was poor on the Moore and Gilliland test; two who were low

on the Downey test kept the eye steady in the staring test. So far as my personal knowledge goes these two persons are not outstandingly forceful. Moore and Gilliland concede that the steady eye does not always guarantee aggressiveness, but they are convinced that a shifty eye is almost invariably accompanied by lack of aggressiveness. This leaves us with one case of striking discrepancy on our hands between the results of the two measures. I do not know the individual in question sufficiently well to pass judgment on her, but I am inclined to doubt her possession of aggressiveness; she is vivacious but not forceful.

Modification of will-temperament test

So much with regard to possible extension of temperamental testing. The question of specific modification of the present series will arise in the near future and may be profitably handled only on the basis of data that will accumulate from new modes of attack. The author has only one or two suggestions to make at this time. The first suggestion is the need of modifying the will-temperament test in such a way as to make it adapted for testing children under twelve. A number of modifications are needed, the main one being the substitution of something in place of writing. I believe that the tracing of simple or devious scrolls might be substituted for those tests that require writing. I make this as a suggestion merely; I have not tried it out.

Another possible modification would consist in the substitution of a tapping test for speed of movement.

Seashore,[1] who employs speed of tapping as a test of general motility, directs that it be carried out as follows:

Speed in tapping a motility test

Motility may be tested roughly in a class by requiring each pupil to take a pencil in hand and tap with it on a pad of paper as fast as possible to find how many taps he can make in five seconds. The hand must be allowed to move freely so that the dots may be counted. Some preliminary instructions should be given as to the importance of making small movements with maximum speed, and a few preliminary trials should not be counted. The number of dots made in five seconds by children of the age of ten will vary from twenty to sixty, and the significant thing is that the number will tend to be fairly constant. The child tends to remain in the twenty class or the fifty class, according as he finds himself in one or the other after the preliminary trials, and these differences are likely to characterize the rate of movement of the respective individuals throughout life.

Lankes,[2] who also thought the natural rate of tapping significant of character traits, carried out the test in a somewhat different way. His instructions adapted to adults were as follows:

Modified form of tapping test

I ask you to sit quite at your ease, and to shut your eyes in order not to be disturbed by your neighbor, and just slightly to move your finger as in tapping. Do not really tap on the table, as that would cause noise and disturb you. The essential and important point in the experiment is the rate or speed of the movement; and your task is simply to move the finger, each one at his own rate, just as he feels

[1] *The Psychology of Musical Talent*, page 173.
[2] *British Journal of Psychology*, Vol. 7, 1914–15.

it natural to himself at the time. So the point is not to move or tap fast, or slow, but just as it comes naturally and spontaneously to each one. And I ask you to count your movements, the number of taps, yourself. I give two signals: First "Ready," then "Now"; start at once at the "Now"; do not forget to count the taps, and stop at once when I say "Stop." And then you will write down the number of movements made, on the paper I have given you.

The experiment was tried twice. It consisted each day of three trials each lasting ten seconds, and succeeding one another after pauses of about one minute. "Correlating the average of the three trials of the first with the average of those of the second day, we find r = .85." The tapping experiment Lankes finds from this high correlation to be of fairly high reliability.

Tapping test: social competition

I have tried out both Seashore's and Lankes's tapping test with a number of groups. Both are undoubtedly usable devices. One word of criticism may be given to each. Seashore's tapping test exaggerates the social competition which we have already found to be one objection to group-testing. When a large group is tapping vigorously, there is noise enough to suggest a pelting hail-storm and this noise stimulates some individuals unduly. Every one is more or less loudly reminded of his neighbors' activity. One vigorous individual may determine the tapping rate of a whole group.

Silent tapping

Lankes's tapping test, on the other hand, is a silent one. But since there is no record made by the pencil,

the examiner must rely absolutely upon the subject's accuracy in his counting of his movements. This involves some possibility of error, particularly in work with young subjects, where there is no way of checking the count. Lankes reported, however, a high reliability coefficient for the test and this high reliability my records confirm.

Tapping tests certainly deserve serious consideration in temperamental testing, since they easily lend themselves to group work. My own experiments with different groups gave a range of correlational coefficients for speeded writing and audible tapping from + .36 to + .54. Lankes's silent tapping gave a correlation of .38 with normal speed of writing.

CHAPTER ELEVEN

Testing the Will-Temperament Test

Intelligence testing under fire

INTELLIGENCE testing has been under fire for seventeen years. Recent attacks on it are no less vigorous than of old but much more discriminating, for the whole movement has served to clarify our thinking on psychological and social topics in numberless ways.

Testing the will-temperament test leads to clearer conception of problems involved

A new departure such as that of temperamental testing rightfully calls down a fire of criticism directed both at the general project and at the way in which the project has been carried out. Specific criticisms, especially those based upon experimental work, are bound to be of the greatest value not only in revision of the series of tests in which the author is interested but also in the establishment of principles for experimental analysis of a phase of mind which has heretofore been neglected in the laboratory of the psychologist.

The present chapter will summarize the critical investigations of the will-temperament test reported by others: the four chapters that follow will describe the methods of testing the test used by the author.

Criticisms of will-profile tests

Two general criticisms should be met at the outset: first, that the tests lack a statistical background; and, secondly, that it is a mistake to label the tests

with the name of specific personality traits. Let us consider these criticisms in turn.

The first criticism is well taken. The will-temperament tests *do* lack a statistical background. In time I hope this deficiency may be supplied. Possibly the experimental background compensates in part for the meagerness of the statistical treatment. It has already been stated that the choice of tests for the will-temperament series was determined by more than a decade's experimental work on handwriting and muscle-reading. The reasons for inclusion of each test have already been given. But a general summary of the basal argument will not be out of place.[1]

Choice of tests for will-profile dictated by experimental work

Experiments on muscle-reading—carried out in the hope of finding a method for discovery of temperament types—had convinced me that such types did reveal themselves in the delicate reactions by which the muscle-reader is guided but that muscle-reading was too dependent upon the skill of the reader to be a usable psychological method. During this investigation, however, I made a connection with my experiments on handwriting which proved valuable, for I discovered that it was a simple matter to select exceptionally good guides for demonstrations in muscle-reading by a preliminary trial of writing under distraction of attention. The "good

[1] "Control Processes in Modified Handwriting," *Psychological Review Monograph* 37, 1908. *Graphology and the Psychology of Handwriting*, Warwick and York, 1919. "Muscle-Reading: A Method of Investigating Involuntary Movements and Mental Types," *Psychological Review*, Vol. 5, 1908.

guides" under such distraction produce an enlarged and rapid hand. Extensive observation has thoroughly convinced me that this magnified and semi-automatic writing, produced when attention is partially distracted by a concurrent process, distinguishes the impetuous individual for whom the motor discharge takes place easily and readily. Writing, decreased in size or greatly retarded in speed, appears under the same circumstances for those individuals who "hold on to themselves painfully," who do not yield readily to automatism, who respond with increased effort of attention to the demand to handle a double process. The latter are the inhibited, obstructed, pondering type of individual.

To balance the test on impulsion as an indication of the individual's reaction tendencies when the brakes are off, I sought to introduce reactions when, by instructions, the brakes are on. This purpose led naturally to utilization of retarded and disguised writing and of an accurate graphic imitation. Moreover, I found that the ease or difficulty with which a "set" for speed or one for "accuracy" could be established was a most interesting individual difference.

That the will-temperament tests are in the early pioneer stage I am well aware. Criticism is warmly welcomed. But I am frequently sensitive to the fact that my critics do not have the background given by my previous studies and that there is little realization that the tests were not selected in hit-or-miss fashion,

but have been developed to a certain extent from the application of a general principle.

Tests labeled with names of personality traits

The second criticism bears upon the author's attempt to label each of the twelve tests of the temperamental series as a test of a particular personality trait. It has been suggested, and with excellent reason, that the correct procedure would be to name each test in terms of the reaction involved, without attempting to couple it with the name of a personality trait, and then determine whether or not the test has differential value in educational or vocational guidance. For example, instead of labeling disguised handwriting a test of flexibility, why not refer to the test as one of disguising handwriting and determine whether this test can be used in the selection of individuals of differing gifts?

I have no doubt that such a procedure is the logical one and would have avoided many embarrassments precipitated by the introduction into experimental work of a number of terms very vaguely defined and very vaguely understood. On the other hand, I believe it would have been difficult to arouse interest in the material by following this program. The other procedure has served as a challenge which has been taken up in many quarters and which, whatever the outcome, should result in clearer definitions of terms and more precise understanding of what is involved in temperamental and volitional tests.

The published investigations have attacked from various angles the problem of testing the test.

(1) Do the tests tap the traits suggested?

First, there has been an attempt to determine whether the will-temperament tests actually tap the personality qualities suggested by the labels used; and

(2) Have the tests differential value?

Secondly, there has been an attempt to determine the differential value of the several tests; whether, that is, they can be used to pick out individuals showing strength or weakness in certain situations.

Test results correlated with personal estimates

An accepted method of procedure in determining whether a particular test taps a particular personality-trait is to correlate a group ranking on such a basis with a ranking obtained from personal estimates. There is a wide margin of error involved in such a method, not only because of the subjectivity of character-judgments but because of the possibility, or even probability, of various interpretations of the names given to character traits. None the less, this method of attack inevitably suggests itself; it should, however, be carefully safeguarded in many directions.

Will-profiles of delinquent boys

Miss Bryant [1] gave the will-temperament test to each of 100 delinquent boys at the Whittier State School. The total score obtained on it was then correlated with independent estimates made by three highly qualified persons on a total score obtained from grading each boy on a scale of five for each of the following "volitional" traits: Self-control; self-confidence; power of concentration; persistence; initiative in everyday affairs. "A correlation of .29 was found between the rating and the test score.

[1] "The 'Will-Profile' of Delinquent Boys." *Journal of Delinquency*, Vol. 6, pages 294–309, 1921.

According to Rugg, this is a 'present but low' correlation."

The use of the total score obtained on the will-profile in correlation with the total obtained on the five traits listed above is of problematic value. The will-temperament is designed to test the activity or dynamic level of the individual, and certain of the traits are inversely correlated. Possibly a rating on the total for the five traits named above should correlate with the total on a group of traits in the will-temperament test—such, for example, as motor impulsion, motor inhibition, perseveration, reaction to contradiction, care for detail and resistance to opposition. I should not, however, be surprised to find that, even among the five traits chosen by Miss Bryant, certain negative relationships exist. "Self-control," if carried so far as to be inhibitory, is probably negatively related to "initiative" in everyday affairs. Miss Bryant reports that the correlation between the score on volitional perseveration alone and the rating for persistence is .34, "present but low."

Ruch [1] has worked out correlations for ratings of graduate students by the will-temperament test and by groups of fellow-students and faculty instructors, for both a "pooled estimate" and the test scores for each separate trait of the will-temperament series. His general conclusion, based on total averages, is as follows: "Considerable agreement be-

[1] "A Preliminary Study of the Correlations between Estimates of Volitional Traits and the Results from the Downey Will-Profile." *Journal of Applied Psychology*, Vol. 5, pages 159–162.

tween judges, but little or none between estimates and tests is shown."

Questionable value of character-ratings

Ruch's report suggests a number of points that need to be held in mind in testing the will-temperament test. Not only is Ruch's group a small one for an order of rank (it was composed of only 15 individuals) but it is also presumably a closely selected group where one might anticipate a close massing of the scores received on particular traits of the will-profile, where only a ten-fold grouping is employed.

One would also like to know how his subjects varied in age, and whether the physique or other dominating aspects of personality were such as to influence the group judgment. Outstanding traits might well operate to raise the correlations between the ratings by the two groups of judges. Six months' acquaintance with a subject does not warrant a very close judgment on specific items. One may bank for a considerable time on a general reputation or a first impression.[1]

Personally, I have grown very skeptical of the unsupported judgment of individuals on one another or of the judgment set by social prestige. In my opinion, the greatest value of such a study as that of Ruch's lies in a close analysis of the social factors operating in determining the judgment of individuals or of a group. Where, as Ruch found true in three cases, there is a negative correlation between the pooled estimates of faculty and fellow-students, an

[1] At this point one may profitably refer back to Rugg's article: "Is the Rating of Human Character Practicable?" (pages 29–31).

analysis of the situation might reveal some interesting social factors operating in character judgments.

There are also instances in Ruch's report of negative correlations for one group of judges with the results of the test and of positive correlations for the other group. This suggests either inadequate understanding of the terms used in the will-temperament test, or of the individuals rated.

From Ruch's table one gets an impression that certain subjects were more easily and consistently rated than were others of the group. The consistency of impression made by an individual is a personality trait of considerable importance. One can't help wishing that Ruch had gone somewhat into case-studies, which would undoubtedly have illuminated his findings. As it is, the points of real interest are lost in emphasis of an average.

Norman C. Meier, in a carefully planned experiment [1] on a large group of high-school students, sought to determine the agreement between the judgments of teachers and parents and measurements by the will-temperament tests, for each of the 12 personality traits. His correlations were so low as to be indecisive. But so were the correlations between the ratings given by teachers and parents. He writes: [2]

> The only conclusion of course is that it is impossible to ascertain whether it is the test, the estimates, or both that are at fault. There is some indication that the estimates

[1] Master's thesis, University of Chicago.
[2] Private correspondence.

were biased, as all estimates are to some degree. This is shown by undue concentration of "average" estimates, also a disproportionate concentration about the scores of 9 and 10. (This appears in the distribution curves.) There is some indication that some of the traits are measured better than others by the test. Freedom from load seems farthest from agreement with estimates, whereas speed of movement, finality of judgment, motor inhibition, and interest in detail seem to show consistency if not high correlation.

Do different tests for the same personality trait agree in outcome?

Another way of checking the significance of the terms used in the will-profile is to find the correlation of the results of each test with other tests of presumably the same trait. Such a procedure not only avoids the margin of error involved in personal estimates but also furnishes opportunity for analysis of results.

Danger of accepting any one test as an index of a character trait

This method is that adopted by R. O. Filter in his valuable paper, "An Experimental Study of Character Traits." [1] Filter's paper includes some experimental material on two of the tests of the will-temperament series, namely, reaction to contradiction and checking of character traits.

Filter's main contention is the danger of accepting uncritically any one test as an index of a character trait, since the various situations that might call it out may well induce various responses. Furthermore, a so-called character trait may be an ambiguous term applicable to many different types of behavior. One must concede the value of Filter's criticism.

Filter outlines 13 typical situations and reactions

[1] *Journal of Applied Psychology*, Vol. 5, pages 297–317, 1921.

involving self-assurance in a way that suggests a thorough program for investigation. But as an illustration of the subjective element involved in interpretation of the meaning of various terms in the vocabulary of personality traits, I may instance my surprise at Filter's inclusion of ready and speedy reactions as significant of self-assurance. Readiness in acceptance of a task or acceptance of many tasks would for me be symptomatic of a high degree of "motor impulsiveness" rather than self-assurance, or confidence in one's own powers. Nor had I credited speed of reaction to self-assurance. I find, however, from inquiry that many individuals, particularly those who wait for directions or need a strong invitation to set off a response, do so credit it. Have we here a compensatory reaction?

Program for testing self-assurance

Filter, as an outcome of his investigation, discards speed items from his table, stating that speed of decision is not an expression of self-assurance. I may say in passing that my correlational plots show no evidence of correlation of speed of decision and reaction to contradiction, which Filter lists as item 12 in his table, although there is evidence of a slight correlation of the latter with speed of movement. On the other hand, there is a slight positive correlation of reaction to contradiction with my test for motor impulsion, and also with resistance to opposition and with interest in detail. The latter relationship is particularly instructive, since it calls attention to one of the factors—namely, careful observation—that motivates a positive reaction to contradiction.

As a matter of fact, the ten responses I have listed in reaction to contradiction furnish, if read in connection with the other scores on the profile, a most subtle means of analysis but one not generally understood by my critics. The scores 7 and 8 represent such a reaction as that described by Filter as maintenance of conviction. They occur in the profiles of careful, deliberate individuals who hold to their position because of their care in observation rather than because of vigorous self-assertion, such as is the case for those scoring 9 and 10.

I am inclined to believe that my profile furnishes material for checking nearly all of the situations and reactions for self-assurance listed by Filter but approached from different angles, such as motor impulsion, care for detail, and volitional perseveration. Double-checking and overestimation of self on character traits may furnish additional items for scoring, although I have not yet analyzed the material I have collected on this point.

Speed of decision in various situations

Filter's study of speed of decision is more conclusive than his study of self-assurance and is highly valuable. Using six different situations and 142 subjects, he obtained intercorrelations for speed of decision in the six situations. Four of the six items were subjective in nature; two objective. His conclusions, drawn from the table of correlations, are as follows:

> If the coefficients are accepted at their face value, or with some allowance for the attenuating circumstance, they

would seem to indicate a degree of constancy in speed of decision. . . . The correlations are not high enough, however, to warrant the conclusion that any one test would serve as a measure of speed of decision. . . . On the whole, there is less correlation between the speed in objective types of decision and the subjective types than there is between the different subjective types here tested.

Filter's analysis of his results is more valuable than his citation of correlational coefficients. On the basis of the 80 and 20 percentile scores he classifies for each of the six tests the individuals who were tested into three groups—namely, speedy, slow, and ordinary. It was possible to estimate from the score sheets the number of times an individual was similarly grouped for the six situations.

The results indicate that about 10 per cent of individuals may be called truly speedy in decision, 13 per cent truly slow, and 8 per cent mediocre in decision. The other 69 per cent would presumably fluctuate too greatly from one situation to another to permit classification.

Objective and subjective judgments

The figures cited above for the percentage of individuals who may be described as consistently speedy, slow, or mediocre in speed of decision are based on the results obtained from situations encouraging both objective and subjective judgments. In the case of the former, "bumping into reality" may serve to modify speed. The subjective judgment is not open to correction to the same degree, and should therefore serve the better in testing out temperamental qualities. It was for this reason I used, in testing

for speed of decision, checking of character traits—a reaction which, for a very great majority of individuals, is a highly subjective operation.

Subjective judgments used in testing temperament

Mr. Filter in correspondence with the author has kindly furnished the following figures as giving the percentages for the speedy, slow, and mediocre reactions when the two objective judgments are dropped and the percentages calculated for the subjective alone, as follows:

Quick	12%
Slow	13%
Mediocre	17%

If we use these figures we may reduce the fluctuating group to 58 per cent.

With older subjects I believe this percentage would be further decreased, since age seems to increase the probability of a "set" reaction. In any case we are left, as in intelligence testing, with a large central group that with the present methods defies accurate classification.

Filter himself states that the objective material he utilized involved a visual factor and that visual endowment as a special capacity may have complicated the situation.

This possibility leads me to ask two questions which are of great importance in weighing the outcome of temperamental tests:

(1) To what extent do specific habits or capacities mask temperamental reactions?

(2) Are different temperamental types differently susceptible to contact with reality?

I shall attempt to answer these questions elsewhere.

Positive results from application of the Carnegie adaptation of the will-temperament test

Considerable work on the will-temperament tests has been carried on at the Carnegie Institute of Technology. In order to make possible the testing of large numbers of subjects, the individual form of the test was there adapted for group-testing. In process of doing this some changes in the tests have been introduced and a few additions made (notably an excellent test for self-consciousness, devised by Dr. M. J. Ream). Dr. Ream has published [1] a report on the group will-temperament tests and their relationship to the Downey individual will-temperament test. The degree of agreement between the various individual tests and the Carnegie group adaptation of them is estimated by the citing of correlational coefficients.

Dr. Ream further reports: "Some parts of the test have proved to be of positive value and are now included in the selection program for insurance salesmen prepared by the Carnegie Bureau of Personnel Research."

Dr. Yoakum [2] has also reported that certain items of the Downey will-temperament test as modified by M. J. Ream are indicative of success in salesmanship, "whereas tests of general mental ability, aside from assigning a minimum essential, had little predicative value."

[1] "Group Will-Temperament Tests." *Journal of Educational Psychology*, Vol. 13, pages 7–16, 1922.

[2] *Journal of Educational Psychology*, Vol. 13, page 109, 1922.

An unpublished master's thesis from the Carnegie Institute of Technology, by Leo Dewey Anderson, entitled "The Value of an Adaptation of the Downey Will-Temperament Tests as a Supplement to the Thurstone College Entrance Tests in Predicting Freshman Scholarship," has many points of interest.

Mr. Anderson tested 578 freshmen, distributed in four groups of very different interests as follows:

(1) Division of Art—artistic temperament;
(2) Division of Science and Engineering—technical type;
(3) Division of Margaret Morrison School—social and public type;
(4) Division of Industries—men of mechanical bent.

Mr. Anderson found that the artistic group excelled in handwriting disguise; that the technical type ran high on the careful tests, but low on the speed items; that the social and public type was high on speed items and low on care items; and that the men of mechanical bent were most careful of detail.

This furnishes valuable confirmation of the reasons that operated in the selection of the tests for flexibility, speed, and interest in detail.

Dr. Ream (*loc. cit.*) also says: "An unpublished study of the students of dramatic art at the Carnegie Institute of Technology gives some evidence in support of the suggestion that versatility in disguising one's handwriting is characteristic of the histrionic or fluidic temperament."

Will-profile and improvement in conduct of delinquent boys

W. W. Clark[1] has reported an interesting diagnostic use of the total score on the will-profile. For 73 boys of the Whittier State School, Whittier, California, Clark found that the correlation of "the average response ratings and the score obtained in the will-profile test is −.22. This indicates a slight negative relationship between the two factors. When the relation between the test score and the change in response was computed, the correlation was found to be .26, indicating that boys with a high will-profile score were more likely to improve their response. It is significant that this test gave a higher correlation for all cases—negative in the case of average response and positive in the case of change in response—than the other general factors, age, retardation, intelligence, and temperament."

And again, "Further experimentation with the will-profile scale is desirable purely from its possible administrative value as indicating to a certain extent the response that may be expected in a given case." Clark makes no interpretation of his finding. Possibly the individuals scoring low on the profile are those who succumb easily both to discipline within the institution and to temptation outside of it.

It is, I hope, evident that a diagnostic use of the total score is quite different from an interpretation of it as a quantitative measure of "aggressiveness,"

[1] "Supervised Conduct—Response of Delinquent Boys." *Journal of Delinquency*, Vol. 6, pages 386–400, 1921.

will-power, or whatever term may be chosen as most inclusive.

Educational diagnosis

A much-needed investigation and one which the group tests make possible is the value of the will-temperament tests in educational diagnosis. Using a combined score on intelligence and will-temperament, can one obtain higher correlations with school and college grades than results from use of the intelligence score alone? The author's work on this point will be presented in another chapter. I hope that school administrators will follow up this question, and suggest the use in this connection of the total score on the will-profile.

A "tension" test analyzes disparities between intelligence and scholarship

C. L. Stone,[1] in analyzing the "Disparity between Intelligence and Scholarship" for the members of a class in Dartmouth College, made use of a couple of the will-profile tests. To quote:

> To measure tension of their normal work, a modification of the Downey will-profile test was given: The subject was asked to write the phrase "The American Legion" at his usual rate and in his usual style, then to write it as rapidly as possible. The speeded time divided by the normal time gave a quotient which was regarded as a measurement of his usual tension. To measure perseverance, the same phrase was written as slowly as possible, and this time divided by the normal time.

On the basis of the correlations obtained Stone concludes,

> their tendencies seem to justify the assumption that discrepancies in favor of scholarship may be measured by

[1] *Journal of Educational Psychology*. Vol. 13, 1922.

some sort of perseverance or tension test, and discrepancies in favor of intelligence by some test which measures facility in absorbing the environment. Such tests deserve investigation.

Case studies

The author's confidence in the personality patterns revealed by the will-temperament has been confirmed by the citation by other investigators of instances in which the profile is spoken of as highly characteristic of an individual as revealed by his case-history or by prolonged observation. Experience has given me a wealth of material of this sort. During the last four years I have many times seen the profile win out in the face of conflicting social opinions.

Bryant's case

Miss Bryant has given, in the article previously cited, several interesting cases. One is quoted below: [1]

Case 3. In Fig. 7 [2] the profile with the lowest score (22) is reproduced. This boy rates as a low-grade moron, having an I. Q. of 56. He has been tried at numerous occupations during his two years in the Whittier State School and has not been a success at anything. He is forgetful, with no ability to concentrate upon the task at hand, and has practically no resistance. He has, however, a degree of self-confidence quite out of proportion to his ability. His mental age of nine years does not entirely account for his failure, since the ordinary nine-year-old boy shows greater capacity for usefulness than does this boy. The will-profile indicates relatively high "assurance" but marked inferiority of all other traits, especially "resistance." This profile is remarkably characteristic of the reagent.

[1] *Loc. cit.*, page 301.
[2] Not given here.

Dr. Ziegler's case

Dr. Ziegler [1] has also reported a case-study in which he included a will-temperament test. The following summary is taken from his report.

> X was given Downey's Will-Temperament Test. Curve IV presents the results of this examination. The principal features of the curve are lack of motor inhibition, his care for details, and his aggressive make-up. According to the author of this test, the curve resembles those of paranoid cases. In "Reaction to Contradiction," X scored perfect according to the test. In motor impulsion and speed of decision, he has rather high ratings. When one examines his previous history, he cannot but be impressed by the correlation of these test facts with his life.

In the next four chapters the author will present her own procedure in testing the will-temperament test. Four lines of investigation have been followed:

(1) The validity of the general will-profile was tested by the success of judges in identifying the profiles of personal acquaintances.

(2) Profiles were plotted from the records obtained from psychotic or insane subjects to determine whether such profiles would show exaggerated patterns and whether well-known symptoms of different clinical varieties would be revealed by the test.

(3) Competent individuals were asked to rate themselves on a scale of 10 for each trait contained in the will-profile and their ratings of themselves were compared with their scores on the test—of which scores they were ignorant.

[1] "A Study of 'X,' Psychometric and Otherwise." *American Journal of Psychiatry,* Vol. 1, 1921.

(4) The principles embodied in the will-temperament test were applied to a type of motor activity other than handwriting to find out whether it would yield a profile comparable to that obtained by the first method.

CHAPTER TWELVE

The Identification of Will-Profiles

The validity of the will-profile tested by number of times it is identified

IN testing the validity of the will-profile as a temperamental portrait which would be recognized by one who knew the original of it, the following method was employed: A group of twelve profiles was submitted to an individual, together with a list of the names of the persons from whom the profiles were obtained. He was instructed to pair each name on his list with a profile; that is, he was to select the profile that seemed to him most representative of each individual on his list of names.

In this series of experiments, three groups of twelve profiles each were used. One group had been obtained from young women college students; a second from male college students; and a third from university instructors, four women and eight men.

The instructions given each participant in the experiment are reproduced below. As an outcome of later work on the will-temperament test a number of modifications in these instructions suggest themselves as desirable. It will be understood, however, that the report on the experiment is reproducing the exact procedure at the time it was carried out.[1] At that time only ten traits were included in the profile.

[1] "Some Volitional Patterns Revealed by the Will-Profile." *Journal of Experimental Psychology*, Vol. 3, 1920.

INSTRUCTIONS

Instructions for the test

You are to identify, if possible, the Will-Profile that fits each person on the list of names given you.

The profiles are graphs which represent the score attained by a given individual on a number of given traits. The method of scoring is as follows:

A score of 10 is the highest given. It would be received by the upper ten per cent in a group of 100.

1 would be the score received by the lowest ten per cent in a group of 100.

The other scores grade between 10 and 1 by equal intervals. The traits scored may be defined as follows:

1. Speed of Movement: Speed of movement relative to size of person, and age.
2. Freedom from Inertia or Load: Tendency to work at one's highest speed without external pressure; little tendency to relax speed; quickness in warming up to a task.
3. Flexibility: Ease and success in readjustment; capacity to modify one's routine reactions.
4. Speed of Decision: Quickness in reaching a decision or conclusion. A slow reaction may be due to caution or conservatism in weighing the elements involved in a situation or be caused by one's being side-tracked by irrelevant matters or by a rambling procedure.
5. Motor Impulsion: This trait refers both to impetuosity and energy of reaction. Consider the ease with which brakes or inhibitions are removed and also the tendency to an explosive reaction when the brakes are actually off.
6. Assurance:[1] This refers to the degree of confidence with which one maintains his opinion against contradiction. A 9 or 10 reaction signifies an aggressive

[1] Later called "Reaction to Contradiction." The term "assurance" is misunderstood by many individuals.

reaction—the burden of proof is thrown on the person who dces the contradicting; 7 and 8 are confident reactions but reasons are cited for one's confidence, since the burden of proof is accepted; 5 and 6 are tactful reactions; below 5 there is a grading down to a complete failure to assert one's own opinion.

7. Resistance:[1] The vigor with which one reacts immediately to a blocking of one's purpose. It grades from a strenuous reaction, to complete passivity in the face of opposition.
8. Motor Inhibition: Capacity to keep in mind a set purpose and achieve it *slowly*. It involves power of motor control, imperturbability, and patience.
9. Care for Detail:[2] Attention to details. This trait is not equivalent to accuracy, which usually carries an implication of power of keen analysis. One may possess great capacity for detail and yet lack penetration in the selection of details. Care for detail is more evident in execution of a plan than in cleverness in making a plan.
10. Coördination of Impulses: Capacity to execute a double task without a preliminary trial; capacity to handle a complex situation successfully without forgetting either factor involved. This trait is probably allied to keeping one's head in a confusing situation.

In studying the profiles, give some attention to the general pattern as well as to the scoring on specific traits. In the case of a quick-reacting person the graph runs high at the beginning of the profile; it will run low at the beginning in the case of the leisurely, deliberate type of person who carries considerable load. The central part of the profile runs high for the aggressive person. There is an emphasis

[1] Later called "Resistance to Opposition."
[2] Later called "Interest in Detail."

of the latter part of the curve for the careful, deliberate type.

One may find one-peaked patterns, two-peaked patterns, and balanced patterns *at any level of scoring.* Remember 5 and 6 represent a median score. A zig-zag pattern demands particular study, as it may represent a modification of the natural reaction by training.

Caution: Do not attempt to identify the profile of some one whom you know only by reputation or of whom you have only a general impression. Some specific acquaintance with an individual is necessary.

If you are in doubt as to the meaning of any point in instructions, question the examiner about it.

Identification of profiles by intimate acquaintances possible

The experiment showed that the identification of profiles required considerable effort of attention and power of analysis on the part of those who attempted the task. Several of the traits included in the profile (i. e., freedom from inertia) were new concepts to the judges. In order to make a satisfactory judgment, the latter needed more than a casual acquaintance with the persons whose profiles were being analyzed and not many observers were intimately enough acquainted with each individual in a group of 12 to make satisfactory intercomparisons.

Correct identification of profiles ran from 0 to 5 out of 12, or from total failure to identify any profile (1 judge) to 41 per cent of successful identifications (2 judges). The percentage of successes for the total of 144 judgments (12 judgments by each of 12 judges) was 22, where chance success would be less than 1 per cent.

The figures summarizing the results of the experi-

ment cannot be regarded as having great value, but the investigation brought to light several important facts:

(1) The more intimately an observer knew an individual, the greater chance there was of his correctly identifying the latter's profile. Such a result not only evidences the general value of the profile in personality study, but suggests that frequently it might be used by acquaintances in extension of their everyday knowledge of a person.

Errors due to similarities in profiles

(2) Even in case of incorrect identifications, the judgments, except for one or two very inexpert reagents, were not dictated by chance. There is often considerable agreement as to the *type* of profile chosen for a subject though a specific identification is at fault. Such confusions are due to general similarity of pattern in the make-up of certain individuals.

Individuals not equally expert in reading personalities

(3) Individuals vary greatly in their interest in, and capacity to estimate, character traits. With a selected group of judges, successes in identification of will-profiles would run fairly high. In this preliminary experiment, the best records were made by the Dean of the College of Agriculture at Wyoming—whose administrative duties enforce a practical interest in character analysis—and by a student of psychology, who undoubtedly has native capacity in this line.

Profiles presented in groups of three

In modification of the method of procedure in such a way as to be able to utilize the judgments of observers who knew intimately only a few individuals whose profiles had been plotted, and yet to insure

a simple method of estimating chance versus actual successes, I decided to submit the profiles in groups of three, requesting the observer to choose from these three profiles the one which best fitted a particular person. This person's name was the only name given the judge in this experiment and his only task was to select from the three profiles presented the one best fitting the owner of this name. Chance success of 33⅓ per cent could be anticipated. In order to isolate certain factors for study, I arranged my material in two series.

Series A: similar profiles

In Series A, I presented a given profile with two others like it in general pattern. This series is obviously a difficul one to pass judgment on. In Series B, I presented the same profiles but with contrasting patterns. Series B is, relatively, an easy one to handle.

Series B: contrasting profiles

The combinations in which any particular profile was presented were kept constant for all observers. Furthermore, the profiles of men students were compared only with those of other male students; those of women students with those of their own sex; and those of university instructors with those of university instructors. This latter condition probably rendered the experiment slightly more difficult than if profiles had been taken indiscriminately from any of the groups. Sex and age in themselves leave an imprint upon the will-temperament, as will be shown later, and if profiles are mixed indiscriminately it is possible to use the age and sex factors to help one in identification of a particular profile.

TABLE I

PER CENT OF SUCCESSFUL IDENTIFICATION OF PROFILES

Profiles	Number of Judgments	% Correct of Whole Group	Highest % Correct of Any Judge	Lowest % Correct of Any Judge
SERIES A:				
Faculty	69	33.3	55.5	0
Men Students	54	44.4	60.0	0
Women Students	37	51.3	100.00 [a]	0
Total	160	41.3	100.00 [b]	0
SERIES B:				
Faculty	75	78.7	100.00	0 [b]
Men Students	57	71.9	100.00	0 [b]
Women Students	31	58.6	100.00	0 [b]
Total	163	72.3	100.00	0 [b]

[a] Only one judgment given, next highest 75 per cent (3 R. judgments out of a total of four).

[b] Only one judgment given.

The instructions used in the preliminary series were also used in this modified experiment, except that the observer was told that after picking the one profile of the three that seemed to fit best the person whose name had been given him, he might criticize it with respect to any score which he thought did not truly represent the person. By this means I obtained some valuable suggestions as to possible defects in the tests.

In B, easy to select the right profile

The results of this experiment are given in Table I. From the total series of judgments, it is evident that a profile is identified slightly more frequently than chance would lead us to expect, even when the profile is submitted with others like it in general pattern; while, when the same profile is compared with

contrasting profiles, the probability that the correct profile will be identified is fairly high.

Still more convincing of the value of the profile in analysis of one's temperamental pattern are the successes achieved by the best judges. Thus under the definitely difficult conditions of Series A, a judge has been able to identify correctly in one group 6 of 11 profiles (55 per cent) or in another group, 3 out of 4 (75 per cent). In Series B, there are a number of judges who make 100 per cent of correct identifications.

Study of the table reveals an interesting possibility which an inspection of the graphs confirms. In the judgments on the profiles of university instructors, the percentage of successes is, in Series A, the lowest of the three, in Series B, highest. Such figures would suggest the possibility of this group of profiles being more highly patterned than those obtained from the younger subjects, and hence more easily confused when submitted for identification with similar patterns but for the same reason more easily identified in connection with contrasting patterns.

Patterned profiles

There can be no question of the fact that certain individuals present a much more highly patterned reaction to the will-temperament test than do others, and that these patterned profiles are under certain circumstances more easily identified than irregular profiles are. The profile of the methodical, careful, deliberate type is more easily identified than that of the quick, flexible type, particularly if the latter combines aggressive traits with his quickness of re-

action, in which case there is, I believe, a tendency to overestimate the probable score on all other traits. This type is, on the whole, overestimated for intelligence also when a judgment is based by the observer on general impression.

High or low level profiles

A study of the right and wrong judgments in both Series A and Series B reveals some interesting facts. Profiles which maintain a very high or very low level throughout the graph are usually identified without difficulty in both series. This result indicates that a general impression of force or weakness is conveyed by personality and mirrored in the level at which the profile runs.

A profile representative of a deliberate, consistent, stable personality is identified with relative ease. Profiles obtained from unstable, inconsistent, variable types of personality were difficult to identify. One anticipates fluctuation on the part of the latter in his record on repeated tests by the will-profile. He illustrates the "cyclothymic" type of person described by Rosanoff in the citation from this author in the first chapter.

Other sources of error in identification were also evident. Frequently the impression made by the general appearance of a person does not accord with the true temperament. Age or youth or physique masks the true nature except for very discriminating observers. Casual observation is not sufficient for adequate interpretation.[1]

[1] Again I would call attention to Rugg's investigation of the influence on opinion of "conspicuous traits" and to Thorndike's recognition of the "halo."

In illustration of this last statement, a study should be made of Profile VI (page 81). The general impression received from the original is that of vivacity, alertness, quickness, and decisiveness. Subject is small, youthful, buoyant. This exterior masks very great care and deliberateness in forming a judgment and extreme sensitiveness to detail. Close observation reveals some inertia in her make-up. In Series A, her profile is not once chosen correctly. But there is a curious difference in the profile selected as hers by faculty and by student judges. Her faculty colleagues choose a profile emphasizing quickness and flexibility of reaction. They look for a pattern in which the outstanding feature is speed of every sort. Students, on the other hand, look for aggressiveness of reaction and great care for detail. The correct profile runs high on speed of movement, flexibility, assurance, coördination of impulses, and care for detail. It dips at speed of decision, freedom from inertia, and resistance to opposition. The original pronounces it an excellent representation, with a reservation concerning the score for coördination of impulses, which she considers higher than is warranted.

Physique

Cases of mistaken identification

A contrasting case is furnished by the profile of B, who physically gives the impression of being slow-moving, careful, and deliberate, but who, from his will-profile, would appear to be a quickly reacting, careless individual.

The will-profile conveys a more accurate impression than his physique does, as I proved by extensive ex-

periment. His speed of decision is excessively rapid; his care for detail, distressingly inadequate; his speed of movement, very great. His movements are so smooth and well coördinated as to give no impression of effort. This absence of flurry and of excess movement deceives the ordinary observer, who is apt to judge rapidity of movement by the presence of nervous excess movements and signs of tension rather than by the amount accomplished per unit of time.

This characteristic judgment of the ordinary observer reminds the author of a story read recently in which the hero, who failed to get his promotions as rapidly as he deserved them, was advised to do his work with a little more fuss and noise so as to show that he actually was overcoming obstacles and accomplishing a great deal! In everyday life people who work under tension and speed up with effort are ordinarily rated as more rapid workers than those who do as much but with less evidence of effort. The man who raises most dust in sweeping is soonest relieved!

One's own temperamental bias

The bias of one's own temperament leads one sometimes to overestimate another's possession of a certain trait: sometimes, to underestimate it. For example, an amiable woman who attempted to identify profiles for me insisted that *every* man should score 10 for assurance! Obviously she failed to reckon with the effect of her own non-aggressiveness in the treatment of her by others. Individuals who themselves rank very high in their interest in detail are almost sure to underestimate the possession by others

of this trait. Their ideal is so high that few there be that come up to it!

Judgments on Profile VI mentioned earlier in the chapter gave me interesting material on the effect of bias of temperament on character judgments. Usually the original of this graph is, mistakenly, described as quick and impulsive, but she is called *very* slow and methodical by an intimate friend, who has such an excessively fluidic and almost inertialess make-up, that by comparison all hesitation seems extreme.

The whole experiment on identification of profiles indicated that individuals vary greatly in their capacity to judge others correctly. A judgment is obviously at fault when the man who makes it chooses in a second trial a different profile, or when he is at variance with the judge best qualified to pass on a particular case.

A number of those most successful in the identification of profiles are of a slow, deliberate, temperamental type. As an outcome of another experiment it appears that this latter type is apt to be characterized by eye-mindedness. If so, such judges had in this experiment the advantage of dealing with a visual scheme. One verbal-minded judge has, in fact, complained of the presentation to him of temperamental traits in a visual form that means nothing to him.

The deliberate person of slight motor impulsion apt to be a good judge of character

Judges who run low on motor impulsion appear to be more accurate in their identifications of temperamental patterns than is the explosive type. This

type of individual has, apparently, an obsession for character analysis—a beautiful confirmation of the suggestion that individuals temperamentally on the defensive have a stronger motive for understanding others than have those who are temperamentally on the offensive. They avoid conflicts by foreseeing them. For the mobile individual, sufficient unto the day is the quarrel thereof! It is the latter, however, who is apt to establish the social reputation of a man by free comments on him and his actions. The critical, obstructed person reserves his more subtle analysis for a scientific treatise or cherishes it secretly as evidence, for home consumption only, of his keener penetration.

The impulsive individual more apt to "set reputations"

CHAPTER THIRTEEN

Will-Profiles of Psychotic and Psychopathic Subjects

EARLY in the investigation of the will-temperament test it was given to a group of psychotic, or insane, subjects.

The object in testing such subjects was twofold:

(1) To find out whether different varieties of psychotic subjects would give will-profiles resembling those obtained from specific normal temperamental types, but in an exaggerated form—a proposition which has been advanced by a number of writers on abnormal psychology; and

The will-temperament test and profiles of psychotic subjects

(2) To find out whether well-established symptoms of certain clinical types would actually be revealed by the scores on the will-temperament test.

It seemed, for example, that if the tests were well chosen, dementia precox patients should make a low score on freedom from load; manic patients should score high on motor impulsion; depressed patients should score low on motor impulsion and on speed of decision; and that because of the failure of normal control and stability, all types of patient might score low on motor inhibition. Work with psychotic subjects seemed well adapted to testing the value of these particular items of the will-profile.

Sample profiles reproduced

The specific assumptions listed above were all confirmed and, in addition, much further material for estimating the significance of various tests obtained. The general outcome may be summarized by presentation of sample profiles, two each for the following clinical groups; namely, dementia precox, manic, depressed, and psychopathic patients.[1] All were tested in the Boston Psychopathic Hospital during the summer of 1918, and, in every case, the diagnosis is that made by the hospital staff. In general, as compared with the profile of the normal adult, the profile of the psychotic patient is characterized by great inequalities in scoring; the graph runs high at some points, very low at others, for all groups except perhaps one type of psychopathic personality. There are, however, differences between the groups which I shall proceed to detail.

The dementia precox profile

Let us study, first, the profiles obtained from the dementia precox group. I examined six patients suffering with this disorder. Five of the six gave what appears to be a characteristic pattern. (See Profiles IX and X, page 205.) This pattern shows great retardation in speed, excessive load, and relatively little power of inhibition or coördination. At the center of the profile the graph has a relatively high peak for such traits as motor impulsion and reaction

[1] These profiles were obtained in the early stages of the investigation and are, therefore, less satisfactory than those that might be obtained today. The norms for scoring are based on reactions from normal subjects and, consequently, extreme departures from normal may be massed together in the ultimate scores (1 and 10). More flexible scoring may be attempted in the future. The profile of the normal adult is used throughout as the standard of reference.

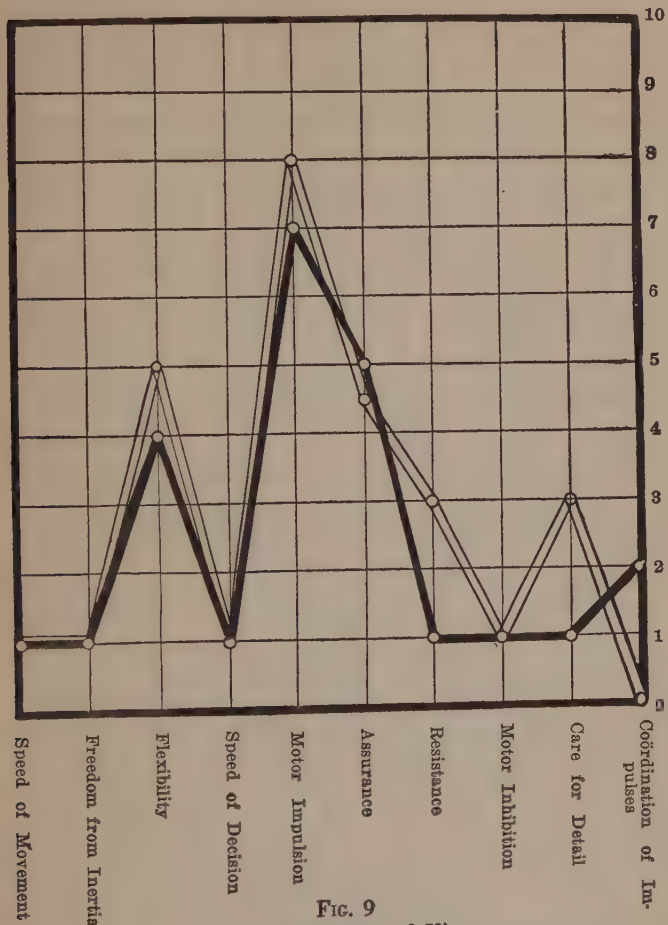


FIG. 9
(Profiles IX and X)

to contradiction. It is difficult to get these subjects to react at a signal and almost impossible to force speeding. There is a strong tendency to retouch writing.

The sixth—or outstanding case—that of a highly

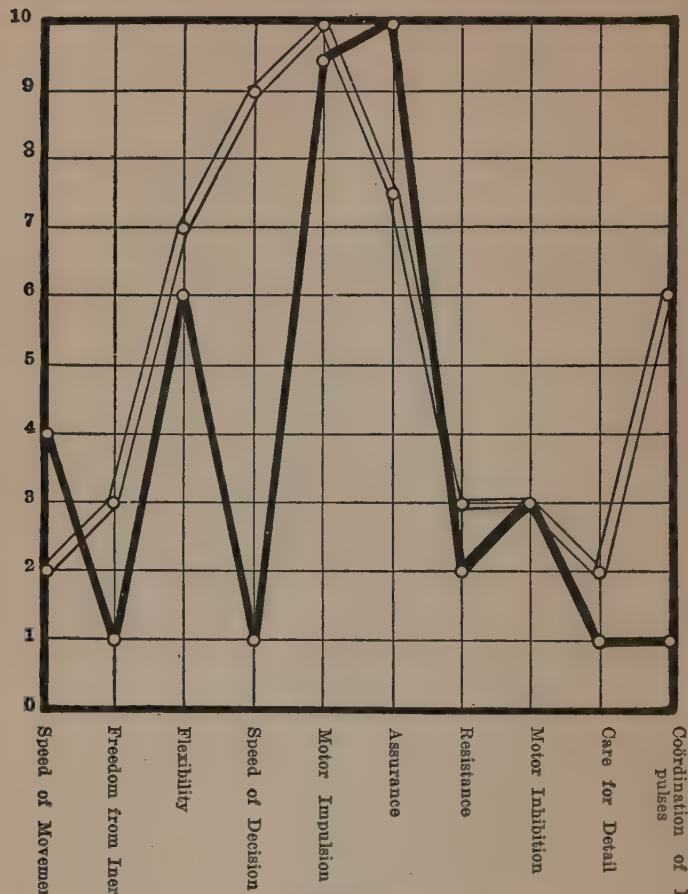


FIG. 10
(Profiles XI and XII)

educated chemist, did not give a picture similar to that of the other members of the group, nor a comparably low score. At the time of trial the diagnosis of the case was somewhat uncertain. At staff meet-

ing the vote was: paranoia, 2; dementia precox paranoid, 4; paraphrenia, 1; unclassified paranoid condition, 1. The general form of the profile is like that obtained from patients suffering from paranoia.

Two dementia precox cases I was able to retest under markedly different physical conditions. In one instance there was shown in the second trial, under improved conditions, distinctly less retardation and load than in the first trial. The second case on the second trial gave a decrease in motor impulsion and in aggressiveness as compared with the first examination, which had been made when the patient was recovering from a maniacal attack. It would appear, then, that variations in reactions occur with variations in physical condition.

The manic profile

Four patients were examined in the manic group. In general, this group runs high on the aggressive traits, excessively high on motor impulsion. (See Profiles XI and XII, page 206.) The graph dips at both ends but not to the degree found in the dementia precox patient. The total score runs higher than for dementia precox. There are many premature reactions to signals and, in the passing of character judgments on self, a loss of time through unnecessary and frequently irrelevant comments. The salient characteristic of the group as a whole is the high score on motor impulsion, scored on the amount of increase in writing amplitude with distraction of attention.

I was unable to get permission to reproduce the signatures of these patients so as to show the really

extraordinary enlargement of writing that results with distraction of attention. I am giving, instead, a drawing which suggests the degree of enlargement. In Figure 11, the inner oblong gives the space enclosing the normal signature of one of the manic patients, the outer oblong the space needed to enclose the name which was written when the attention was distracted.

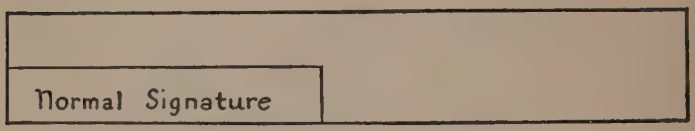


Fig. 11

Profile of the depressed patient

I obtained only two complete records from patients in the depressed phase of manic-depressive insanity. Under extreme depression it was difficult to get any reaction whatever. The scores are excessively low for speed of movement and of decision; in the latter case was found a maximum of emotional blocking. The scores are also low for motor impulsion and for coördination of impulses. The two profiles reproduced (XIII and XIV, page 209) show great interest in detail and more capacity for motor inhibition than is evident in other groups. The total score is low.

Figure 12 gives some idea of the amount of decrease in size of signature under distraction. Here

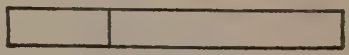


Fig. 12

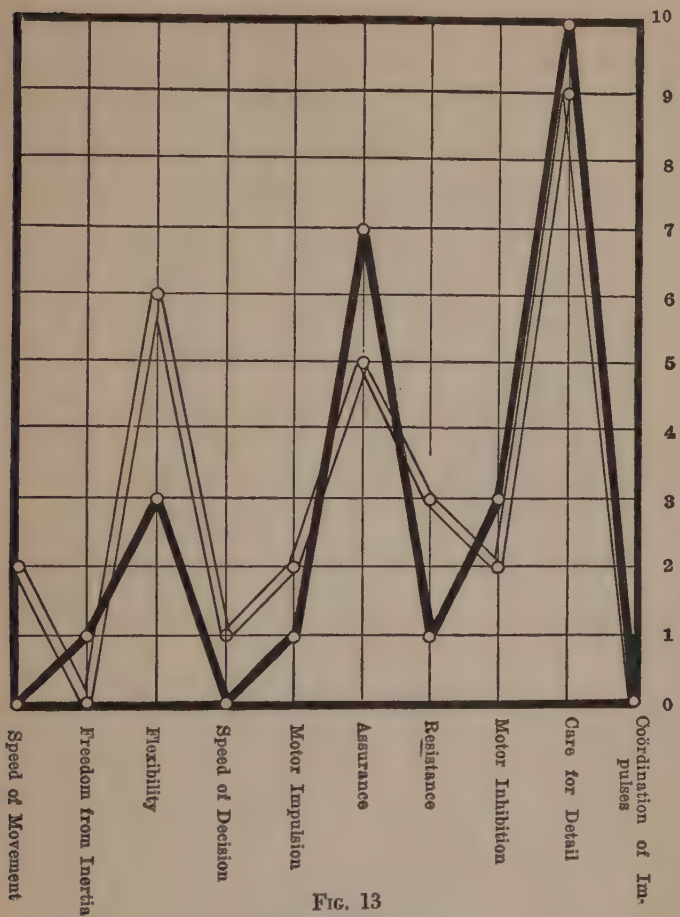


Fig. 13
(Profiles XIII and XIV)

the inner oblong gives the space enclosing the signature written under distraction, the outer oblong the normal signature of the same patient.

Five patients were examined in the group labeled

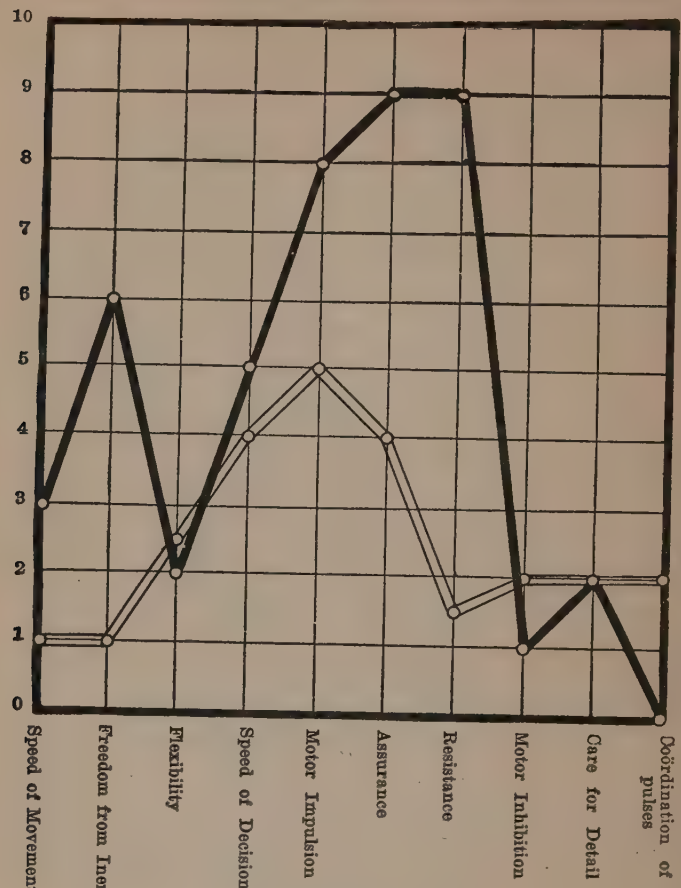


FIG. 14
(Profiles XV and XVI)

Psychopathic personalities; two forms of profile

psychopathic personalities. One (see Profile XVI, page 210) gave a low record throughout, with a total score of only 23. Of the other four, three were sex delinquents and one addicted to drugs. The graphs

of these four (see Profile XV, page 210) run high on motor impulsion and other aggressive traits, with much more speed than characterized the dementia precox or depressed group, much less load, and no evidence of capacity for motor inhibition, care for detail, or coördination of impulses. Flexibility also scored low. As will be emphasized later, extensive testing of this group is highly desirable.

Scattering records from other psychotic groups were also obtained. Two of these records deserve comment.

Paranoid patient

The first was obtained from a case diagnosed at first as paraphrenia expansive, later as unclassified paranoid condition. The patient was euphoric, had delusions of grandeur and of persecution, with auditory and, probably, visual hallucinations. Except for his score on motor inhibition and coördination of impulses his record was a high one. It resembles that obtained from the manic, particularly in excessive motor impulsion.

The patient, a foreigner by birth, had, on coming to America, assumed his wife's name as less difficult to pronounce than his own. With the development of his delusion that he was a count and the heir to sixty million dollars it seemed only proper for him to resume his rightful name. This situation gave me an opportunity in several of the tests which involved the writing of the signature to utilize both names. When either name was written the magnification under distraction was immense, but slightly greater in the name which he had resumed as ap-

propriate to his exalted position. The uncoiling of one signature by the method outlined previously showed an increase of movement equivalent to eight inches. The "noble" name was written more rapidly than the "plebeian," gave less retardation in the test on motor inhibition, and had a hyperkinetic *adductive* underscore (in one signature four and three-quarters inches in extent!) like a big gesture toward himself. A somewhat similar underscore appears also in the other name but is less emphatic and is *abductive* in direction.

A case of psychopathia sexualis

The second case, diagnosed as psychopathia sexualis, was at first dismissed by the hospital authorities as non-psychotic; later the patient, a young man, was returned in a dream-state. Dissociation of personality was suggested. The outstanding features of the profile were high motor impulsion and automatism, absolute passivity in the face of opposition, and a very high score for flexibility. The patient had stage ambitions; he wished to do ballet-dancing, girl-fashion. The automatic writing was definitely more masculine than the normal; the disguised writing more feminine.

Summary of results

In résumé, it may be said that all psychotic patients score low in *speed of movement,* although doubtless some corrections should be made because of graphic inexpertness.

Load was especially evident in the dementia precox group, where it was found impossible to force speed by any device. Manics also showed considerable load and failure to focus, but they *could* and *did* speed

under pressure. Psychopathic personalities gave little evidence of load.

Flexibility was scored low, especially for certain of the psychopathic personalities. The psychopathia sexualis patient scored high.

Speed of decision. A simpler list of character terms should be provided for this test for persons of the social level of these patients. Failure to provide this makes my time records with hospital subjects of somewhat dubious value for this trait. In many instances, however, the quality of reaction was significant; such, for example, as the emotional blocking and agony of indecision on the part of the depressed patients. The wordy comments and many irrelevancies which prolonged the decision-time of the manics were likewise noteworthy, and, also, an occasional mannerism in emphasizing a choice, such as an insistence upon a triple checking or a heavy underscore. Stereotyped reactions appeared in a number of cases, as in that of a patient who finally settled upon the phrase "So-so" as a satisfactory qualification for every decision; and the dementia precox patient who wrote after each pair, "Ask the superintendent!"

The reaction to the test of *motor impulsion* was perhaps most significant of all the reactions.[1] The only patients scoring low on this test were those suf-

[1] It would be profitable to compare in detail the changes in handwriting size under distraction with the size of memory-drawings, as suggested by Josephine Curtis Foster in her report on psychotic subjects ("Significant Responses in Certain Memory Tests," *Journal of Applied Psychology*, Vol. 4, pages 142–154). On the face of

fering from depression. On the other hand the scores on *motor inhibition* were uniformly low.

Reaction to contradiction was usually aggressive, and there was, in a number of cases, a tendency to impugn the motives of the examiner; he is suspected of double-crossing the patient by substitution of the harder for the easier test. The reaction to physical *opposition* is much less strenuous than it is to contradiction.[1] Many refuse to push on even when urged to do so.

All groups scored low on *coördination of impulses*, but the mode of failure varied. Psychopathic personalities and dementia precox patients sacrificed space requirements to time; manics, time to space; the depressed failed from both ends. Not even by taking an excessively long time for the task could they handle it adequately.

Interest in detail was low except for depressed subjects and for paranoia cases or those of paranoid form of dementia precox.

So far as the general purpose which motivated the testing of hospital subjects was concerned, it was amply justified. The exaggeration of certain types of reaction, such as excessive load in dementia precox and in depression, deficient motor control in all

the returns there is some agreement with the present report. Since a separate tabulation is not given by Dr. Foster for different phases of manic-depressive insanity, a comparison is difficult for this group.

[1] Cf. E. K. Bryant, "The Will-Profile of Delinquent Boys" (*Journal of Delinquency*, Vol. 6, pages 294–309), who reports that delinquent boys also score low on the resistance to opposition test.

groups, showed that the chosen tests were well adapted to measuring specific traits.

Can we, however, go further than this and assert a likeness between definite psychotic profiles and specific will-temperament patterns?

Resemblance between psychotic profiles and will-temperament patterns?

Rosanoff, as previously cited (page 8), lists four types of personality which may develop into abnormalities, as follows: the antisocial personality; the cyclothymic personality, which is the constitutional basis for manic-depressive psychoses; the autistic or shut-in personality, on which dementia precox or schizophrenic psychoses develop; and the epileptic personality. Rosanoff emphasizes the fact that neither between the different abnormal types nor between them and normal types can sharp lines of demarcation be drawn. "Mixed types are the rule, pure types the exception." And again: "The time-honored classification of temperaments into the quick (sanguine, choleric) and the slow (phlegmatic, melancholic) is obviously based largely on contrasts presented by traits indistinguishable, except in degree, from those observed in the psychiatric clinic as belonging, respectively, to cyclothymic and autistic personalities."

To return to the will-profile. Do any of the patterns it assumes for normal subjects suggest a likeness to psychotic profiles? To a slight extent, yes. The reproductions of mobile and mobile-aggressive profiles (I, page 77, and II, page 78) suggest the manic make-up, plus greater possibilities of control and of focalization of energy.

The profile labeled "deliberate type" (IV, page 79) shows a resemblance to that obtained from patients suffering from depression, although the normal profile runs much higher on motor inhibition. Rosanoff inclines to the belief that the great concentration on his work of the research scientist is related to an autistic trend in his make-up. The profile just cited may easily be interpreted as showing such a trend.

Profile VII (page 83) is, in many respects, so like that obtained from dementia precox patients that one has reason to question the normality of this individual.

Normal profiles show a balance of traits lacking in psychotic profiles

One would not wish, however, to press too far the resemblance between normal and psychiatric patterns. The normal profiles show a balance of traits, or else a consistency of pattern that distinguishes them from abnormal profiles. The former show also less inequality in the scoring on different traits, and in the high-level graphs a score on motor inhibition that suggests the probability of nervous stability and of muscular control, even in a speedy and impulsive make-up.

CHAPTER FOURTEEN

The Will-Profile and Self-Ratings

THE two preceding chapters have contributed evidence to prove that the will-temperament tests have real significance in study of personality. They have shown (1) that *competent* judges are able in a large number of cases to identify the will-profile obtained from an acquaintance, and (2) that well-established symptoms of mental disorder may be detected in the will-profiles of abnormal subjects.

Will-profiles plotted from subject's rating of himself

Another method of testing the value of the temperamental tests in personality analysis was to give to highly educated individuals a careful explanation of the terms employed in the will-profile and to ask them to give themselves a rating on a scale of 10 for each of the twelve traits. A graph, or profile, was then plotted on the basis of their self-rating. A second profile was plotted from the scores that they made on the test itself. Juxtaposition of the two graphs made possible a close comparison of the outcome for each separate item of the test and for the pattern as a whole.[1]

[1] Tried out in 1920, but results now published for the first time. Ream (*loc. cit.*, pages 13 f.) used a somewhat similar method of testing out his group adaptation of the will-profile test, but the self-ratings were given with knowledge of the results of the test. This discounts the outcome of the test to some degree. Ream reports it as slightly confirmatory of the value of the will-profile.

The agreement notable

Three pairs of graphs are presented to illustrate both the method of comparison and the really impressive agreement between the self-ratings of a competent judge (double-line graph) and the results of the test (single-line graph). Through a mistake these graphs were plotted only for the first ten traits. Moreover, the judges were asked to rate themselves for "Perseverance" and "Revision" rather than for "Volitional Perseveration" and "Finality of Judgment," terms which were later substituted for those first used. (See pages 153 and 127.)

Let us consider, first, Profile XVII, page 219, the record obtained from Professor P., University of Chicago, age 56.

P., who is greatly interested in character analysis, characterizes himself as highly introverted in type, slow and accurate in thought but quick and inaccurate in movement, with no motor skill; excellent control of his life, but with tendency to lose his head under pressure. The graph plotted from the scores obtained on the tests easily lends itself to such an interpretation.

Comparison of the self-rating and the test-rating for each of ten traits shows that there was exact agreement in the scoring of four traits; agreement within one figure for two traits; within two figures for one trait; and within three and four figures for three others. The average discrepancy between the rating by the scale and by the subject is 1.5, or fifteen per cent.

The two four-figure displacements challenge atten-

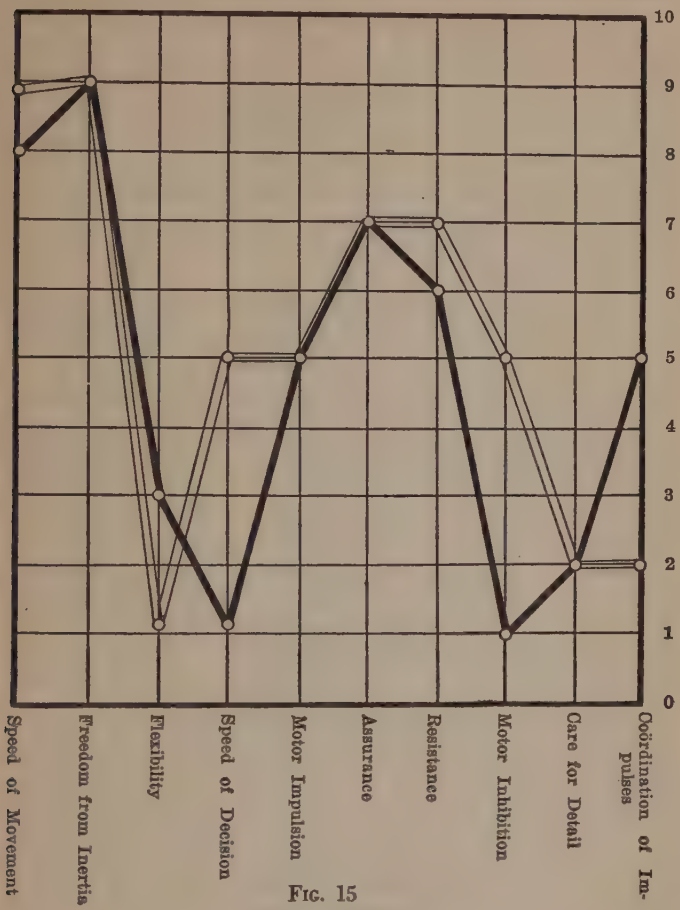


FIG. 15
(Profile XVII)

tion. One occurs for speed of decision. P. rates himself at 5 on this trait but with the reservation that he revises his decisions afterwards. Quite possibly in giving himself a score he attempted to disentangle

two factors in making a decision; namely, reaching a preliminary conclusion and then revising it. Such a disentanglement of contributory factors was not practicable in testing for speed of decision. The net outcome is that, for practical purposes, P. *is* slow in deciding, although his actual thought process may be a series of moderately rapid approximations of his final decision.

The second four-place discrepancy between P.'s rating of self and that by the scale is for motor inhibition. I believe P. overestimated this capacity because of his failure to realize that age had decreased his power of motor control. The vital question centers around the interpretation of the decreasing score on retarded writing that appears from the late forties on. Is the effect merely one of loss of motor control, or is there a real connection between such loss of control and a change in temperamental traits? This question has been discussed elsewhere, with the suggestion that work on the will-temperament is too recent a matter to present a solution.

The second record, Profile XVIII (page 221), was obtained from B., also a professor in the University of Chicago, age 34 years. The graph plotted from the scores received on the test is more highly patterned than that obtained from a self-rating. It suggests a physically deliberate, not highly aggressive individual, flexible and mentally speedy. The self-rating is in practical agreement with the scale-rating for two traits; shows a one-figure displacement for four traits; a two-figure for three; and a three-figure dis-

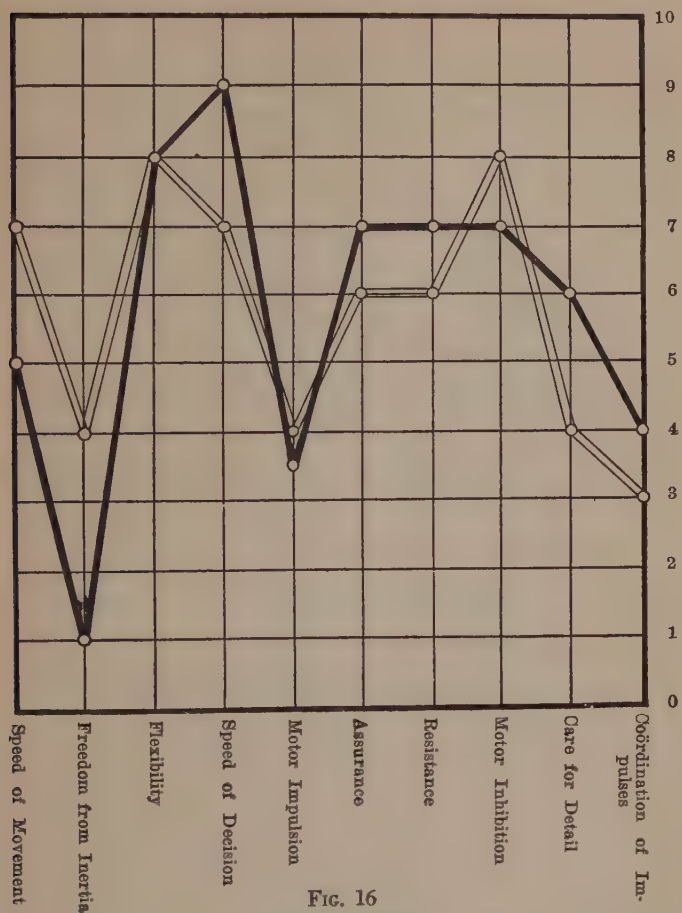


FIG. 16
(Profile XVIII)

placement for one. The average displacement is 1.35, or about fourteen per cent. The three-step disagreement is for freedom from load. Careful observation of many details in the subject's behavior, such as his

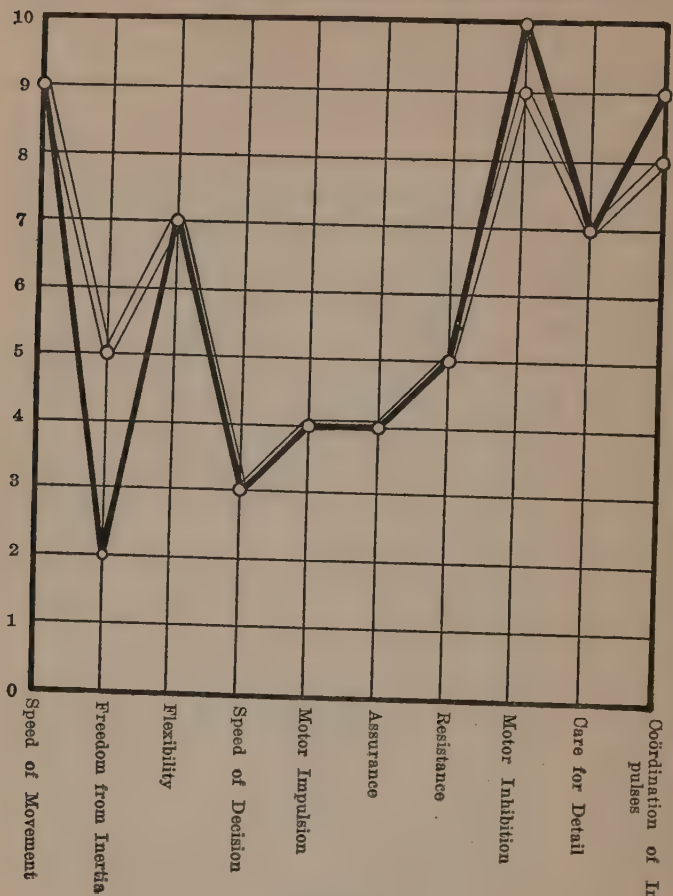


Fig. 17
(Profile XIX)

speech-habits and general movements, convinced me that the scale-rating was correct and that he actually underestimates the amount of inertia in his make-up.

From C., age 31, an instructor in the University

of Chicago, I obtained the self-rating and the scale-rating for Profile XIX (page 222). Again, the graph suggests a deliberate, careful person, decidely lacking in aggressiveness. His own rating agrees with the scores received on the test to an extraordinary degree. There was exact agreement for seven traits; a one-figure displacement for two traits; and a three-figure displacement for one trait. The average displacement is .5, one-half of one step on the scale.

The foregoing comparisons between a self- and a scale-rating illustrate the present method of testing the value of the will-profile in determination of character traits. It indicates also a practicable way of estimating the margin of error in a subject's estimation of self, as soon as the will-temperament test is perfected.

Average difference in rating by self and by test

To test the adequacy of the scale for each test rather than for the pattern as a whole, the average difference in self-placement and placement by the test was calculated for each trait for twenty-one judges, all of superior education and intelligence. It was thus possible to determine the points of greatest and least agreement between self-rating and rating by the scale.

Table II presents in numerical form the material obtained. The twenty-one records utilized are separated into two groups. Group I was composed of very highly selected individuals of scientific training; Group II was composed of fourteen individuals of somewhat divergent interests—the majority were university graduate students in various departments.

TABLE II

AVERAGE DIFFERENCE IN SCORE, RATING BY SELF AND BY TEST

Group	Speed of Movement	Freedom from Load	Flexibility	Speed of Decision	Motor Impulsion	Assurance [a]
I (7)	1.21	2.00	1.55	1.71	0.68	1.60
II (14)	1.57	2.03	2.19	1.61	1.66	1.53
I & II (21)	1.45	2.02	1.97	1.65	1.17	1.53

[a] Reaction to Contradiction.

Group	Resistance	Motor Inhibition	Revision [b]	Care for Detail	Coördination of Impulses	Perseverance [c]
I (7)	1.00	1.71	2.00	1.57	2.57	2.14
II (14)	1.50	3.21	1.28	2.57	3.42	2.50
I & II (21)	1.31	2.71	1.52	2.23	2.85	2.21

[b] Finality of Judgment.
[c] Volitional Perseveration.

On the whole, the first, or more highly selected group, gives a closer agreement with the test results than does the second group. This in itself is, so far as it goes, confirmatory of the value of the scale.

Average displacement ranges from 12 to 29 per cent.

The average displacement for both groups ranges from approximately twelve to about twenty-nine per cent of the scale. The discrepancy is least for motor impulsion, resistance to opposition, speed of move-

ment, care for detail, and assurance; greatest for perseverance (compared with score on volitional perseveration), motor inhibition, coördination of impulses, revision (compared with the score on finality of judgment), and freedom from load.

Reason for discrepancies

Discrepancies between a self-rating and a rating by the test may be attributed, in part, to the inadequacy of the tests; in part, to the inexpertness or biased attitude of the judges. In the case of the five traits showing the greatest amount of discrepancy the following observations are pertinent:

Perseverance. The judges were asked to rate themselves for Perseverance. They should have been asked instead to score themselves on Volitional Perseveration, as it appeared from later study that this was the trait revealed by a prolonged effort to disguise handwriting. The difference between perseverance and volitional perseveration has been commented on previously (page 155) and need not be repeated here.

Motor inhibition. Three factors previously commented on (page 135) operate to affect the score on motor inhibition and need to be considered in estimating the achievement of a particular individual. These factors are, (1) the effect of practice on capacity to retard writing; (2) the effect of sex; and (3) the effect of age. Failure to reckon with age as a factor decreasing power of motor inhibition accounts, in some measure, for the inaccuracy with which older individuals rate themselves on this trait.

Failure to give a sufficient number of trials for retarded writing operated to introduce actual inaccuracy in scoring by the test.

Coördination of impulses. There exists some uncertainty as to just the exact trait tapped by this test (see page 149). In estimating one's own value in an emergency one is uncertain how to weight the two factors of doing something quickly and doing the right thing deliberately. Emergencies that are very quickly over may defraud the imperturbable individual of any chance to react at all; while chance may favor the person who rushes in where a cooler individual hesitates.

Freedom from load. The discrepancy between the test-score and a self-rating is, in the case of this particular trait, due largely to the difficulty an individual experiences in rating himself on this quality. I have tried having a group of individuals rate others for this trait and I find that the score on the test gives only a 1.5 displacement when compared with the judgments passed on an examinee by intimate acquaintances. As for myself, I find that the score on freedom from load is one of the easiest for me to anticipate if the subject has been under observation for some time. For example, an arrangement in order of merit for absence of load was made for thirteen of my colleagues before they were given the test. When the estimate was compared with the experimental results, only two significant displacements were found. Six individuals had been located within one place. Of the two big discrepancies one was

clearly due to bad judgment on my part, as was shown by further study of the subject. The other discrepancy arose from the use of writing as the test material, for the subject in this instance was a very highly practiced penman.

Tendency to over- or under-estimate one's possession of certain qualities

I have scrutinized the self-ratings in order to determine when possible the presence of certain factors of bias on the part of the self-judges. The most striking evidence of bias is related to an age factor. The older judges show a tendency to underestimate their speed of decision, coördination of impulses, and care for detail, while the younger subjects overestimate their possession of these traits. On the other hand, older subjects overestimate their possession of motor impulsion and motor inhibition, this overestimate in the latter case being due, as previously stated, to failure on the part of subjects to realize the growing loss of motor control with age.

A very great tendency at all ages for many individuals to overestimate their capacity for perseverance is evident in the accumulation of scores that represent judgments on self at the upper end of a scale of 10.

The author found that the same tendency operated among college freshmen. Fifty-five freshmen were asked to rate themselves for perseverance on a scale of 10, comparing themselves with contemporaries of the same social status. The expected median score was 5.5; the actual median score was 7.2, evidencing a considerable margin of overestimation.

The operation of a general constant error of over

(or under) estimation of self is evident for a number of traits. Its amount ranges from about five to fifteen per cent in terms of the scale used. Were such a correction made in the rating of self, with further corrections recognized as due to variable individual errors, we would find the scale ratings highly satisfactory for speed of movement, flexibility, speed of decision, motor impulsion, assurance, resistance, and care for detail. The line of revision for the remaining tests has already been suggested.

CHAPTER FIFTEEN

Speech and Will-Temperament

THE application of the principle embodied in the will-temperament test to a type of motor activity other than handwriting furnishes in the opinion of the author one of the best ways of determining whether or not the profile obtained by the graphic method has general significance. If, in the main, a will-profile from a second form of motor reaction follows the pattern of one found from writing exercises we gain increased confidence in the principle operating in the selection of tests for the will-temperament and at the same time obtain an alternative series of tests, —a most desirable thing.

Temperamental differences and speech characteristics

As far back as 1908, commenting on the two distinct types of writing-reaction (sensory and motor) revealed by experimental investigation, the author suggested the need of paralleling the investigation on writing-control with similar ones on other material in order to find out whether subjects would fall within the same class or be differently grouped by a new experiment. As interest in the will-temperament developed I found that I could select subjects for particular kinds of profiles by careful study of their speech characteristics. For instance, the individual who spoke with extreme deliberation or, perhaps, drawled

gave usually a will-temperament profile running low on speed of movement and of decision, low on motor impulsion, and, sometimes, high on detail. If such an individual was also incapable of speeding (much tension evident in natural reaction), then under pressure he might actually block in his speech. Precision of speech was also noted in selecting subjects, and the reverse, slovenliness or speech that tumbled over itself. Precise speech suggested great interest in detail; slovenly speech, failure of such interest; and cluttering speech, strong motor impulsion with deficient motor inhibition.

The orator

Study of public speakers led to other interesting observations. The orator, as he became interested in his topic and let himself go, was seen to exhibit more and more freedom in voice and gesture, without losing his control of either. Both volume of voice and speed of articulation might increase greatly. The inferior speaker, as his attention became riveted on his subject-matter, not only showed some hesitancy in finding words but also produced an ever thinner voice. Such speakers might, it is true, put over a memorized and thoroughly practiced speech but could not trust themselves to do big things in an impromptu way.

But here, obviously, the old question of motor impulsion and motor inhibition was to the front again. Is not the orator the hyperkinetic individual yielding to speech automatisms as he becomes absorbed in his audience and subject and the other man the akinetic individual, who loses force and impressiveness under

the complications of the situation? For an interesting sample of the high degree of motor impulsion exhibited by an orator of international reputation the reader should study the signature (written under distraction) by Mrs. Carrie Chapman Catt and reproduced on page 320.

Says Gowin of Napoleon:

Gowin on Napoleon

As inspiration came to him his voice assumed a more animated tone, and was accompanied by a sort of habit, which consisted in a movement of the right arm, which he twisted, at the same time pulling the cuff of the sleeve of his coat with his hand. In rendering his thought, expressions came without effort. They were sometimes incorrect, but their very incorrectness added to the energy of his language, and even marvelously described what he had wished to say.

Gross, in his *Criminal Psychology*, has considerable to say concerning revelations through the voice. He points out that Herbert Spencer has made fine observations concerning the importance of the "timbre" of speech in relation to emotional states and quotes Darwin to the effect that a person who is quietly complaining of bad treatment or is suffering a little almost always speaks in a high tone of voice; and that deep groans or high and piercing shrieks indicate extreme pain. He adds:

Darwin

That timbres may deceive, or simulations worthy of the name occur, I hardly believe. Such deceptions are often attempted and begun, but they demand the entire attention of the person who tries them, and that can be given only

for a short time. In the very instant that the matter he is speaking of requires the attention of the speaker, his voice involuntarily falls into that tone demanded by its physical determinants.

The technical literature on speech defects is filled with references to the temperamental aspect of speech difficulties.

Scripture

Scripture stresses the importance of the voice as an indication of personality, for he writes,[1] "It is unquestionably true that mental or bodily weakness show themselves clearly in the speech of the individual."

Again, "An excess of energy in articulation often occurs. This may be due to increased vitality of the organism whereby all movements are affected or to diminished accuracy of control."

Tredgold

The slovenly speech of the mental defective is commonly credited to his poor physical and mental tone. Tredgold, in speaking of the speech defects of the feeble-minded, says,[2] "The chief defects consist of a thickness and indistinctness of utterance, an imperfect articulation of consonants, and (rarely) stammering and stuttering. The former of these conditions is partly attributable to abnormal configuration of the palate, lips, jaws, or pharynx, and partly to a general brain inertia or unwillingness to make the necessary effort for distinct enunciation. The consonantal defects are due to similar causes plus a want of coördination." This inability properly to

[1] *The Elements of Experimental Phonetics.*
[2] *Mental Deficiency.* 1920.

coördinate impulses accounts for the tediousness and lack of permanent results of corrective speech work with such individuals. The fact that imperfect or negligent speech is not a constant characteristic of mental defect of a given degree indicates that there is something besides general intelligence involved. Stuttering has long been attributed to emotional disturbances such as dependence on parents, a feeling of inferiority and repression, but the temperamental traits which provide rich soil for such unwholesome growths have been very largely ignored. As early as the first half of the nineteenth century Marshall-Hall and Lichtinger believed that there exists as a basal fact in the etiology of stuttering insufficient "impulses of volition." Despite the prevailing tendency to find an anatomical basis, with the resulting frequency of surgical measures for relief, Merkel, who was a stutterer, believed the cause to be altogether psychic and to lie in "the sphere of the will." [1] In 1911, Appelt brought out his most valuable book,[2] in which he attributes stammering to a disturbance occurring in childhood, the results of which may be removed by Freudian measures. It is difficult to accept this theory as adequate explanation of all cases.

Marshall-Hall and Lichtinger

Merkel

Appelt

Some experimental work has been done along physiological lines, such as that of Robbins with the plethysmograph, in measuring increases in brain vol-

Robbins

[1] *Physiologie der menschlichen Sprache.* 1866.
[2] *Stammering and Its Cure.*

ume in a trepined stammerer.[1] "Stammering was accompanied by much more marked increase in brain volume than could be accounted for by either the physical or mental work used in normal speech. . . . It is reasonable to conclude that increase in brain volume is an important factor in the production of stammering." Robbins's work was undertaken with especial reference to Bluemel's theory that stammering is due to cerebral congestion. It may well be that the tone of the vasomotor system bears a close relation to the conflict between temperamental traits which is discussed below. The aviation tests, it will be recalled, led to a similar conclusion (page 21).

Experimental investigation

A most interesting attempt to secure reliable data which will prove or disprove the validity of certain assigned causes of stuttering is reported by Anderson from the laboratory of the University of Wisconsin:[2] "The purpose is to present briefly some results of a number of special tests designed to detect and measure certain traits in reactions outside of the field of speech, and given in such a way as to show, if possible, whether these traits are definitely associated with stuttering. In view of the large number of alleged causes this experiment work was planned so as to constitute a survey of significant types of mental and physiological processes which are common to vocal

[1] "A Plethysmographic Study of Shock and Stammering in a Trepined Stammerer." *American Journal of Physiology*, Vols. 48 (1919) and 52 (1920).

[2] Anderson, Lewis O., "Preliminary Report of an Experimental Analysis of Causes of Stuttering." *Journal of Applied Psychology*, Vol. 5, 1921.

and non-vocal functions." The tests were aimed principally at innate or at least internal factors. There were three groups or types of subjects: persons of normal speech, those who stutter, and ex-stutterers. The performance of these three groups was compared. The results of a foot-tapping test which was given to reveal a general defect of physical coördination, should such exist, showed no characteristic difference between stutterers and normals but much greater regularity and greater rapidity of performance on the part of ex-stutterers. In order to test rhythm and coördination in relations other than speech the subject was put through a "complicated series of arm movements, in some trials following the beating of a metronome, and in other trials simply going as fast as he could." The results indicate that stutterers tend to do relatively better when following the metronome and thus conform to the generally accepted notion regarding the effect of rhythm on the stutterer's speech.

In memory span for movements stutterers are markedly inferior to normals; the inability to hold several things in mind at the same time is thrown into relief by a block test. The stutterers "have difficulty in grasping several movements simultaneously. The significance of the kinesthetic factor seems to be that in consciously directed speech movements a great many kinesthetic elements must be held in mind and thus coördinated."

One of Anderson's most suggestive remarks is with reference to inhibition. In some stutterers there is a correspondence between lack of inhibition in the

test, which consisted of responding by raising the hand every time "three" was read immediately after an odd number but not after an even number and lack of inhibition in speech and other behavior. "Stutterers differ as to whether they will or will not start a wrong response but tend to agree in inability to check or modify the response after it has been started. His response tends to be of the all-or-none type." In short, "it seems very probable that a general lack of ability to inhibit an impulse after it has found partial expression is an essential factor in stuttering."

Speech defects manifestation of temperamental and volitional traits

This study of Anderson's is important not only on account of its experimental attack but also because of its suggestion that there are innate traits and combinations of traits which are conducive to the development of speech disorders. Perhaps it would state the situation more adequately to say that speech defects are the outward manifestation of temperamental and volitional traits and that the only hope for cure which will be genuine and not merely apparent lies in insight into traits of personality. If this is true, the practical value of a temperamental scale for the study of speech disorders is obvious.

My colleague, Lovisa C. Wagoner, a speech-specialist, undertook therefore to do two things for me:

(1) To attempt a translation of the graphic will-temperament test into a vocal form, and

(2) To collect and study the graphic will-temperament of speech defectives. In the latter case she

was able to use as subjects members of the speech clinic of the University of Wyoming Summer Session.

Her complete report on the work will appear elsewhere. At present I wish to summarize very briefly the outcome of her preliminary investigation. Since it takes a great deal of time to develop and standardize new tests, the report must be understood as a tentative one only. Moreover, one great difficulty in the way of developing a speech-profile must be recognized. Speech, unless a phonographic record is taken, leaves behind it no permanent record which may be studied at leisure in the process of revising a test. For this reason scoring on the quality and volume of the voice and on precision of articulation must be done at the time the test is given. Since such scoring demands expert observation, the examiner must be a trained speech-specialist—as in this instance Miss Wagoner was.

Vocal test recitation of alphabet

In paralleling the graphic test the first consideration was the selection of a vocal activity which would give opportunity for play of pitch, volume, and speed but would not depend upon memory. Because in adults the repetition of the alphabet is reduced to an automatic response, the vocal test employs repetition of the alphabet under various conditions as its medium.

The program followed is submitted below. It will be noticed that it parallels the graphic will-temperament test very closely. Modifications will be intro-

duced in accordance with the deficiencies evident from the preliminary work now to be reported.

OUTLINE—WILL-TEMPERAMENT SPEECH TEST

Procedure in writing test followed

General Instructions: Record changes in volume and pitch of voice and speed of vocalization.

I. Natural speed of vocalizing. Recitation of alphabet three times without stopping. Mean three trials.

II. Freedom from Load.

(*a*) "Recite the alphabet three times without stopping just as rapidly as you possibly can." Three trials. Get ratio to normal or natural speed.

(*b*) Give subject interesting but not difficult material to read aloud. Interrupt three times with questions such as "What was the last word you read?" "What is the meaning of the sentence just before the last one you read?" Time the interval before he begins reading after the signal to continue is given. Give signal very promptly.

III. Flexibility, and Volitional Perseveration.

(*a*) Imitation of falsetto voice.

(*b*) Lowered pitch.

(*c*) Disguised voice. "Change your voice so that no one would recognize it as yours. Practice orally or silently as you wish.

Take your own time. When you are ready, begin reciting the alphabet." Record time to get under way and actual time for repetition.

IV. Motor Impulsion.

(*a*) Recitation of alphabet accompanied by silent reading.

(*b*) Recitation of alphabet by examinee while putting picture-puzzle together.

(*c*) Recitation of alphabet by examinee while counting the experimenter's tapping with a pencil. The subject keeps his eyes on the pencil. Tapping should not be rhythmical.

V. Motor Inhibition.

Recitation of the alphabet as slowly as possible. "Do not pause between the letters and do not slur but prolong the recitation as much as you can."

VI. Care for Detail.

Nicety of enunciation of test phrases, involving different and difficult combinations of sounds.

(*a*) "Read as rapidly as possible."

(*b*) "Read as carefully as possible."

Time and errors should be recorded.

VII. Coördination of Impulses.

(*a*) "Recite the alphabet as rapidly and as softly as possible. Do not whisper."

(*b*) "Recite the alphabet rapidly with exaggerated lip-movements."

(*c*) "Recite the alphabet with spastic lips."

(*d*) "Recite the alphabet as rapidly and as loudly as possible."

VIII. Contradiction.

"Recite the alphabet continuously until I stop you." When the subject has given three repetitions stop him and take time. Then inform him casually that he omitted "a" in the second repetition. Proceed with the experiment as in the writing test.

IX. Nervous Instability.

"Close your eyes and recite the alphabet continuously until I tell you to stop." During the recitation a shrill whistle is blown without warning the examinee.

Correlations

A group of subjects large enough to give sufficient material for norms in scoring has not yet been tested. For a group of thirty-seven subjects correlations with the outcome of the parallel writing-test were worked out by the method of rank differences, utilizing either tentative norms or time records of some sort. The correlations are given below.

Speed of Movement	.05 [a]
Freedom from Load	.20 [b]
Flexibility	.39 [b]
Motor Impulsion	.30 [a]
Reaction to Contradiction	.60 [b]
Motor Inhibition	.63 [a]
Interest in Detail	.38 [c]

Coördination of Impulses	.11 [b]
Volitional Perseveration.....	.46 [a]

[a] Ranking made on flat time.
[b] Ranking made on tentative norms.
[c] Ranking made on difference in time between speeded and careful reading. Only nineteen records available.

It is evident from the outcome of this preliminary work that the vocal test correlates to some degree with the graphic one for the following traits: flexibility, motor impulsion, reaction to contradiction, motor inhibition, interest in detail, and volitional perseveration. There is little evidence of correlation for speed of movement, coördination of impulses, or freedom from load.

A few comments are in order. In the first place, it should be said that the group was somewhat narrowly selected and that a wide spread in the distribution of scores did not occur, a circumstance which tends to reduce correlations. By excluding all individuals with speech difficulties we stacked the cards against ourselves. In the second place there are a number of instances in which the scoring-procedure of the writing test has been followed only in part. This was true for motor impulsion where the ranking was based on the flat time without any effort to weight the changes in voice-volume. Recognition of the latter would certainly increase the correlation of the two tests. Likewise interest in detail has been scored on flat difference in time between a rapid and careful reading without weighting for errors. A higher correlation might be expected from a combined score.

Where tentative norms have been used in scoring different traits, the small group of subjects utilized reduces the value of the results.

Failure to obtain a significant correlation between writing and vocal speed was disappointing and unexpected, since earlier work with another group had given fair correlation between the writing test and speed of articulation in the Woodworth-Wells color-naming test. Miss Wagoner is of the opinion that self-consciousness operates to a high degree in the initial speech tests and that this might be overcome by the repetition of Test I and Test II at the close of the session. Such an arrangement would in fact follow more exactly the conditions in the writing-test, where the writing of the name under various conditions is used as a shock-absorber before the actual test begins.

Most interesting and significant results were obtained from the whistle test—a new test not duplicating any in the graphic series.

Will-profile of speech defectives

The second problem attacked by Miss Wagoner—namely, the characteristics of the graphic will-profile of speech defectives—will be treated here very briefly. In many respects the profiles from speech defectives resembles those obtained from psychopathic subjects. Frequently the total score runs extremely low; in other cases the outstanding feature is a great inequality in the scores for different traits and at times inconsistencies in temperamental pattern. For example, an extremely low score on speed of movement may be balanced by an exceptionally

high one for speed of decision, a temperamental conflict which, as one can easily see, might cause a speech difficulty. Sometimes motor impulsion is the only trait scored high in the whole profile. Such impulsion in conjunction with incapacity to speed or to coördinate might result in nervous irritability, which in turn might manifest itself in a number of different ways. A speech difficulty is but one symptom of nervous instability.

Apart from a possible conflict between speed of movement and speed of decision, the most characteristic features of the profiles of speech defectives are low scores on coördination and on motor inhibition.

More extensive work with the temperamental characteristics of speech defectives will be pushed through, since preoccupation with speech work is one of the dominant interests of the day. From three to five and one-half per cent of the school population is said to be in need of remedial treatment. The social and educational handicap of defective speech is obvious. Clinics and courses for training in the use of corrective measures have recently multiplied and further stimulation of the movement is an outcome of the work on speech defects resulting from injury during the war. But this widespread concern is spending itself very largely in attack upon symptoms. Experimental investigations are limited in number, but it is only from experimental work that we shall gain insight into the real nature of the problems that cry out for solution. Will-temperament testing affords one avenue of approach.

CHAPTER SIXTEEN

Factors That Influence Will-Temperament Scores

IN commenting on the tests that make up the will-temperament series, the author has at various points found it necessary to refer briefly to the effect upon the scores of a number of different factors. These factors will now be discussed in some detail. They include the following:

A. Specific Habits;
B. Age;
C. Intelligence Level;
D. Sex.

A. EFFECT OF SPECIFIC HABITS ON THE WILL-TEMPERAMENT TEST

It is probably true that under pressure of environmental demands specific habits may be acquired which are never generalized (i. e., carried over to other situations) but function only in the limited field in which they were acquired. It may seem to critics of the present test that writing habits are of this type and can therefore have little general value. This criticism, however, has been met by reports on a number of investigations which indicate that the

particular handwriting reactions utilized in the scale *do* have general significance.

Specific habits

The reactions included in the test are for the most part not highly practiced reactions but novel ones in which the native mental "set" finds free expression. The possible exceptions to this statement are now to be discussed. There are some situations in which practice or environmental pressure may greatly influence the score. *These* have been mentioned incidentally in preceding discussions but will now be treated together.

Speed of movement as measured by speed of handwriting is probably influenced by professional or occupational habits.

Much writing increases speed

(1) In some cases an excessive amount of writing may operate to increase an individual's speed for this activity alone. Environmental demands may stress speed, as is true for the note-taking college student, who, under tension of a lecture system of teaching, spurts to the limit and sacrifices legibility to rapidity.

(2) The contrasting instance is that of the writing or grade teacher who may concentrate so excessively on form that he fails completely to reckon with speed-requirements.

Concentration on form, age, and habit conflicts lessons speed

Older subjects who write so rarely that penmanship is for them practically a lost art are at a disadvantage when speed of movement is measured by speed of handwriting, not only on account of their age but because of graphic unaccustomedness.

To equalize these conditions different norms should

be established for different social and occupational groups.

(3) Another condition that may operate to lessen speed is that of conflict of habits, such as occurs when a naturally left-handed child is made to write with the right hand, or when a child who had become practiced on the production of looking-glass script (reversing each letter so that it appears as ordinary script would when seen in a mirror) is made to write in orthodox fashion. A more common origin of habit-conflict is found in a shift from one writing system to another, as when a child who has been taught vertical writing is shifted to Palmer method.[1] Graphic stammering is a by no means uncommon result of habit-conflicts and might be investigated in connection with studies on vocal stammering.

Acceleration or retardation of normal speed of writing

If the speed of normal writing is artificially accelerated or retarded, this circumstance will affect the ratio between normal and speeded writing, and so affect also the score on freedom from load. For example, a habit of graphic spurting may make it difficult for one to speed further even under great pressure; hence a deceptive appearance of freedom from load may result.

"Mental set"

A factor which may influence not only speed of writing but also speed of decision is the assumption of the "mental set" engendered by serving as subject

[1] Among my subjects I have found grade teachers who have shifted their system of handwriting as many as four times. They complain of muscular strain and of the impossibility of making speed.

or examiner in the usual mental test, where speed is emphasized. Sophisticated subjects undoubtedly "carry over" this set of mind from intelligence to will-temperament testing.

Practice of retarded writing

It has already been stated that motor inhibition as measured by the length of time writing may be retarded is influenced by practice and that for this reason at least three trials should be given. The author is not aware of other habits that may unduly influence the will-temperament scores, except that perhaps training in mechanical drawing may increase the carefulness with which writing imitations are produced.

Coaching

Previous experience with the will-temperament test and knowledge of its purpose will, of course, influence scores considerably. In intelligence tests also the coaching of normal adult subjects has considerable effect. In the will-temperament test at least two of the tests, those of checking of character traits and of reaction to contradiction, cannot be given a second time in their original form. Apart from these tests it is possible to repeat the test with closely comparable results, except for unusually sophisticated subjects who are definitely aware of the technique employed. Even in such instances certain types of subjects are unable to simulate another type of reaction with any great degree of success. The excessively deliberate person finds difficulty in speeding up voluntarily; the speedy person may more easily slow down.

A different problem from that of the masking of a

Change in will-temperament pattern

general will-temperament pattern by specific handwriting habits is that of the possibility of permanently changing the reaction in whole or in part by general training. For example, can education determine the relative emphasis of the traits that are included in the will-temperament test? By proper training can one transform a boy slow in movement and in decision, with considerable inertia, into a quick, lively sort of fellow? Can one convert a rapid-fire individual with no interest in detail into a deliberate, excessively careful individual? Can one develop aggressiveness in a boy or girl natively lacking in self-assertiveness and self-confidence? Chapter XXI will discuss this question.

B. INTELLIGENCE AND WILL-TEMPERAMENT

How far does general intelligence affect the score on the will-temperament test?

Low-grade intelligence

That very low intelligence may operate to prevent an understanding of the directions for the tests, or, in the speed of decision test, to make the test unusable, is possible. Except, however, for speed of decision, where the traits listed for the subject to check are not comprehended by individuals of low intelligence, I find it possible to give the will-temperament test even to morons.

To what extent the score on the will-profile and that obtained from a general intelligence test correlate is another question. Since we are seeking to test something besides intelligence, absence of correlation is desirable. A thoroughgoing treatment of

the relation between will-temperament and intelligence would demand a checking over of the score on each trait with the results of the intelligence test chosen. This has not yet been done in a satisfactory manner, but in a number of instances the correlation has been determined for a rating on an intelligence scale and the *total score* on the will-temperament test.

Correlation of intelligence and will-temperament

In some cases only ten tests of the will-profile were used in obtaining the correlation; in other cases twelve tests were utilized. All coefficients were obtained by the method of rank-difference and except when marked otherwise are positive.

Army alpha, 50 college students (Wyoming), 10 tests	.19
Army alpha, 22 summer school students (Cornell University), 10 tests [a]	.27
Army alpha, 22 summer school students (Cornell University), 12 tests [a]	.20
Army alpha, 15 graduate students (Stanford), 12 tests [b]	.09
Thorndike test for high-school graduates, 31 college freshmen, selected to give wide range intelligence (Wyoming), 10 traits	.47
Terman I. Q. (individual test), 20 high-school freshmen (Wyoming), 10 traits	.77
Terman Group Test, 80 high-school students, highly selected group (University of Chicago), 12 tests [c]	.21
Terman I. Q. (individual test), 100 delinquent boys (Whittier State School), 12 tests [d]	.38
Mental age, range 8-8 to 18-5, 100 delinquent boys, (Whittier State School), 12 tests [d]	.48

[a] Tested by Professor W. S. Foster.
[b] Tested by G. M. Ruch.
[c] Tested by N. C. Meier.
[d] Tested by Edythe K. Bryant.

So far as the figures suggest any conclusions, they may be stated as follows: With adults of normal range of intelligence the correlation of intelligence and total score on the will-temperament test is low. With immature subjects the situation is more complicated and not clear. If intelligence and temperament are maturing synchronously there may be, apparently, a high correlation. Under other complications of development, where, for example, we have departures from the usual order of development, this correlation may be less evident.

Mental age

Miss Bryant's report of a higher correlation for the same group of the temperamental total with mental age than with IQ seems to me most interesting, since mental age is more indicative of maturity than is the IQ. If in mental as in physical growth we are moving toward a limit set by our endowment at a rate which is also a matter of original nature, and if a comparable thing is occurring for temperament but with the possibility in particular cases of incompatibilities between either the limit of development or the rate of development for these two phases of personality, we may have to reckon with both in prognostic work.

Prognosis

There is a widespread belief that "character" matures more slowly than intelligence. Certainly several traits tested in the will-profile appear to ripen slowly. The usual thing may be the earlier maturing of intelligence. Cases in which the "setting" of temperament lags unduly or cases in which it has matured early would undoubtedly render prognosis

of achievement in life difficult. It may even prove true that temperamental maturity is more significant of general maturity than is the IQ, so that a high IQ in conjunction with temperamental *immaturity* and a high IQ with great temperamental *maturity* would lead to different anticipations of future development, the latter condition being the less favorable one.

As an example of the effect of early temperamental maturity, I may instance the boy to be cited later as giving the highest total will-profile score of a group of high-school freshmen, Profile XXI (see page 266). For his years his profile ran unduly high on motor inhibition, care for detail, and coördination of impulses. In harmony with this effect of maturity he was given a higher rating by teachers for intelligence than would have been anticipated on the basis of his bare intelligence score. Retested eighteen months later (group method), his total score was found to be practically unchanged, with only minor shifts in the scores received on the different tests. At the time of the first testing he was temperamentally more mature than the other children, but many of them in the year and a half interval between tests gained on him, not only in the will-temperament score but also in the opinion of his teachers and in achievement. Too early maturity or setting of pattern is not desirable.

Types of intelligence

While the correlation of level of intelligence and total will-temperament score appears to be very slight, at least for the adult, the question of the rela-

tion of different temperamental patterns to *quality* of intelligence is another matter. A somewhat technical discussion of this problem will be given in Chapter XVIII; here it may be summarized very briefly.

The slow, deliberate, temperamental type conforms rather consistently to Meumann's so-called slow type of learner. He is an individual with a highly concentrated attention of a narrow range, who learns slowly and forgets slowly, and utilizes much visual imagery. The rapid-fire type recalls Meumann's type of quick learner, who possesses the rapidly adjusting broad-span type of attention that is easily distractible, who learns quickly and forgets quickly and is more largely verbal than visual in his ideational processes. Intermediate temperamental types seem to be, also, intermediate between the learning types.

C. AGE AND WILL-TEMPERAMENT

Age

Age influences the scores on the will-temperament tests very materially, but in order to follow the changes serially from year to year extensive records obtained under absolutely comparable conditions are necessary. In spite of the fact that several hundred individuals have been given the group will-temperament test, such records are not at hand. During the process of standardization various shifts of procedure have been continuously introduced. A few conclusions may, however, be drawn as to the age-trend in certain traits. For four traits the relationship of

age to score may be seen from a tabulation of the median scores given in Table III.

TABLE III

Year-Group	12	13	14	15	16	17
Speed of Movement	33	35	35	38	42	42
Number in Group	50	73	82	73	65	58
Speed of Decision [a]	21	24	16	14.5	15	11
Number in Group.....	31	51	55	46	34	39
Motor Inhibition [b]						
First Trial	21	21	21	20	17	12
Number in Group.....	50	67	60	49	33	37
Freedom from Load	133	143	133	132	139	131
Number in Group	48	53	66	39	15	20

Year-Group	18	19	20	21–25	26–30	Over 30
Speed of Movement.....	43	48	47	48	42	42
Number in Group.....	59	40	41	45	17	29
Speed of Decision [a]	?	?	?	?	?	?
Number in Group.....						
Motor Inhibition [b]						
First Trial	?	?	?	?	?	?
Number in Group.....						
Freedom from Load	127	121	126	130	128	128
Number in Group.....	34	19	23	40	16	26

[a] Preliminary Group-Testing. In later tests time-limit was changed.
[b] Preliminary Group-Testing. Retarded writing used. In later tests tracing of scrolls was substituted for retarded writing.

The foregoing tabulation indicates that within the range from thirteen to seventeen years speed of move-

ment and power of motor inhibition increase with age, while speed of decision decreases. The greatest speed and the greatest freedom from load occur at nineteen and in the early twenties.

With reference to the other traits of the will-profile the records indicate in general greater interest in detail and greater power of coördination of impulses with increase in age. On the other hand, volitional perseveration is more evident in the child than in the adult. The former is willing to practice on a handwriting disguise for a longer time on the average than the adult. The median record of twelve-, thirteen-, and fourteen-year-old subjects is definitely higher than for adults. The child's persistence may be due to his greater interest in mere graphic activity or be an outcome of the schoolroom attitude.

In the employment of the number of items doubly underscored as an index of self-confidence, a curious difference appears in the reaction of adults and children. A distribution of records for ninety high-school children, from eleven to fifteen years of age, showed a definitely bimodal distribution. The children appear to fall rather definitely into two groups, of excessive or of little self-confidence, while the older subjects give a normal distribution. More than fifty per cent of the children doubly underscored no items at all or practically all of them. Unless this result be, in part, due to failure to follow directions, we have an interesting indication of opposed temperamental traits whose development might be studied with great profit.

Concerning other traits of the will-profile, no assertions can be ventured at this time, except that in standardizing the individual test it was noticeable that power of motor inhibition declined from the late forties on and that decisions were made more slowly by the older adults.

Mental and chronological age

Miss Bryant,[1] in her study of delinquent boys, has reported the correlation of a rating for total score on the will-temperament and for *chronological* age as .19. This is a lower correlation than Miss Bryant found with *mental* age. It must, however, be noted that the range of chronological age for her subjects was from 13 to 19 years and of mental ages from 8-8 to 18 years and that the group was composed of individuals where abnormalities in the course of development are assured.

It is, however, highly probable that not only chronological age but also mental age and the IQ may be influential in increasing or decreasing scores. To determine how significant the different factors are would require a comparison of groups of different chronological ages but like mental age, and of unlike mental ages but like chronological age—a comparison which it is not possible to make with the material at hand.

A suggestion of what might result from such a comparison appears from the finding that whereas the median speed of movement for thirty-three fourteen-year-olds in the junior high school was 33, the median speed for twenty-two fourteen-year-olds, high school, was 37 letters per twenty seconds. For the same

[1] *Loc. cit.*

junior high school group, speed of decision was 19, in comparison with 12 for the high school group. The median for motor inhibition is about the same for the two groups. The more advanced children appear to be, in certain respects, nearer the adult type. However, as we are aware, grade-location only approximates roughly intelligence rank. Conclusions must wait upon accumulation of material.

Temperamental pattern

But age influences not only the score that may be anticipated on the individual tests but also the pattern or general effect of the whole. For example, in discussing the median will-profile of a group of high-school freshmen (page 264) it will be shown that the adolescent runs high, *relatively*, on the aggressive traits, such as motor impulsion, reaction to contradiction and to opposition, but low on such traits as motor inhibition, flexibility, interest in detail, and coordination of impulses.

In general, the will-profile of mature adults is more apt to be highly patterned than is that of an immature individual, particularly in the case of the slow and deliberate individual, where age emphasizes just those traits which were underscored by nature. On the other hand, an excessively rapid-fire sort of person need not lose speed with maturity, but he may acquire power of motor inhibition, of coördination, and, possibly, interest in detail in such a way as to make him very efficient.

Setting of pattern: temperamental maturity

The setting of a pattern is, I believe, a symptom of temperamental maturity. Where one gets highly inconsistent scores, much "load" with great speed of

decision, or great interest in detail with low volitional perseveration, considerable change in scores on retesting may be anticipated. Those who shift greatly in their reactions from day to day, unless of course they are deliberately or unconsciously simulating a specific kind of reaction, constitute [1] a group that may be spoken of as unstable. Possibly instability may be thought of as permanent immaturity.

Rosanoff, in his treatment of personality previously referred to (page 8), calls attention to the fact that inherited trends make their appearance at different times during the lifetime of the individual. He writes:

> "I trust I shall not be accused of reckless generalization for saying that in the behavior of all normal children are constantly observed phenomena which, as far as adults are concerned, are met with mainly in the psychiatric clinic."
>
> Epileptic, schizophrenic, manic-depressive manifestations appear at some time in the behavior of the majority of children in the form of "seizures," mutisms, stereotypies, mannerisms, excessive shyness, emotional instability, distractibility, boisterousness. These traits are eventually overlaid by "epistatic factors appearing later in the course of ontogenetic development."

Any method of analysis which would permit us to study the order of development of such "epistatic"

[1] The simulation of a deliberate reaction is not difficult for the rapid-fire type; but it is almost impossible for the very deliberate type to simulate the hair-trigger type. The latter is, it will be noticed, the more flexible of the two.

factors and hence to anticipate their appearance would be very valuable.

D. EFFECT OF SEX ON THE WILL-TEMPERAMENT TEST

The psychic difference between the sexes has been a topic productive of voluminous discussion. Much of this discussion has been merely an expression of opinion and has had little scientific value. But a wide use of mental tests in the school will, in time, furnish material for an exact estimate of the difference in intelligence of boys and girls, of men and women.

Sex differences in intelligence

Up to date, intelligence testing has revealed nothing startling concerning such differences. We do not have on file in the War Department mentality tests from a million and a half women as we have for a million and a half men, but if we had, it is not probable that the conclusions drawn from the testing of girls in public school and college would be changed greatly. The evidence, so far as it goes, indicates little difference between the sexes, at least in the middle range of intelligence.

Intelligence, is, however, only part of the story. There are numerous other possibilities of sex-differences which need to be rescued from dogmatic assertion and made the subject of extensive investigation. Only by controlled experiments shall we be able to untangle the interweaving of social environment and of native endowment that today embarrasses all discussion of sex differences.

Many writers on sex psychology have expressed the opinion that differences in the instinctive, emotional, and temperamental make-up are more potent than are differences in intelligence. Jastrow, for example, writes in his *Character and Temperament:*

Emotional, instinctive, and temperamental sex differences

> Temperamentally, however, unless otherwise conditioned, an overwhelmingly influential factor of one's psychology lies in the primal determination of sex.

Obviously, among the possible contributions of the will-temperament test to applied psychology may be discoveries concerning sex-differences in will-temperament. The author's own study has so far resulted in only two conclusions; both are possibly important:

(1) The much greater power of motor inhibition shown by men,[1] (seventy per cent equal or exceed the median record of women); and

Motor inhibition

(2) The tendency toward a more definitely patterned reaction on the part of young men college students than was found for women students.

Highly patterned profiles

A word concerning the significance of these differences may be ventured. Motor inhibition, it will be recalled, is indicative of power to hold back a motor discharge, control over the motor impulse, an essential capacity for success in sports, skillful manual

[1] This conclusion is justified by tabulation of the original data obtained before establishing norms for the individual test. When no time limit was set, the men easily excelled the women. In the group test with a time limit of two minutes thirty seconds for the tracing of scrolls the median records for 56 men and 62 women (from 19 to 40 years) is exactly the same. The mass experiment is much less delicate than the individual one.

work, and possibly for handling social emergencies. It is more than likely that we find here a sex difference of great importance. It will be recalled in this connection that investigators of sex differences have always reported measurable differences in motor control as one outcome of their experimental work.

Why young women give a less highly patterned reaction than young men do is not evident. There are two possible explanatory suggestions: (1) that they are more amenable to training, which involves the prior question of the effect of general training on will-temperament; and (2) that non-specific reactions are more characteristic because the women are less highly individualized.

Definitely patterned reactions may occur for young women and were the usual outcome when older women were tested. This latter group, however, was a definitely selected group of highly successful women. The whole matter must needs be tabled for further consideration when more material is available.

Mr. Dewey Anderson, in his investigation cited in an earlier chapter, has drawn some interesting conclusions concerning sex differences on the basis of his work with the will-profile: "The girls are quicker than the boys in all the reactions tested out in this investigation. They are not so careful, cannot inhibit so successfully, and cannot coördinate their impulses as well as the boys." The girls are said to show, probably, more perseveration. Since Mr. Anderson tested groups of men and women subjects selected by very diverse vocational interests, it is

difficult to determine how far his results are due to pure sex differences.

Explosive tendencies

It is commonly thought that women are more expressive, more explosive, than men, which possibility might be an outcome either of stronger impulsion or of weaker inhibition of discharge tendencies. Some evidence of the latter being a fact is presented in the foregoing report. If a really distinctive difference of this sort exists between men and women, some interesting political developments may be anticipated with the entrance of women into public life as citizens. Judicial calm may be swept aside by hyperkinetic reformers! If the basal instincts of men and women are also sufficiently different to create different centers of interest or ethical standards, some interesting conflicts of temperament may be anticipated in the near future.

Change of mind

But more and more, as time goes on, popular psychology must be put to the test of actual experiment. Personal opinion and personal bias must meet the ordeal—not of fire, but of statistics! An illustration will make the point clear. Many men automobilists believe that women—as women—are born waverers. You never can tell—they claim—what a woman driver is going to do. Some legal authorities, on the other hand, doubt a woman's capacity to be a good juryman because of the rigidity of her opinion when once it is set.

In the group will-temperament test 108 records of subjects over 20 years of age (47 men and 61 women) were available for study of finality of judgment.

These records were tabulated so as to show sex-differences, with the following results: The median time of revision for men was 69 seconds; for women, 75 seconds. Of the 10 per cent highest records (over 110 seconds) 8 were made by women, 3 by men—a trifle more than their share for women. When the changes of opinion were calculated, the men averaged .98 per man and the women .78 per woman. Only in exceptional cases were more than 3 changes in judgment made; of these extreme cases 2 were women and 2 were men. It would appear from this summary that there is slight evidence that the *average* woman spends a trifle more time in revising her judgment than the *average* man does but that she changes her mind to a slightly less degree. The differences are, however, so slight as to encourage suspension of judgment on the question at issue and to lead one to suspect that, as has been found true in so much experimental work on sex psychology, individual differences are much more significant than sex differences are.

CHAPTER SEVENTEEN

Supplementing an Intelligence Test by a Will-Temperament Test

Academic performance and intelligence level

IN the literature on tests one frequently runs across discrepancies between intelligence level and academic performance, with the suggestion either that the intelligence scale utilized is inadequate in certain respects or that such discrepancies are to be explained by an appeal to temperamental or character traits.

Will-temperament test to supplement intelligence rating

To determine whether the will-temperament scale could be used to supplement an intelligence rating in educational diagnosis and prognosis, the individual form of it was given to two groups, one composed of twenty-one high-school freshmen, tested on 10 traits in 1919 and reported on in the *Journal of Educational Psychology*, 1920; the other to thirty-four college freshmen, tested on 12 traits in 1920 and reported on in *School and Society*, 1920. The former had been given the Stanford Revision of the Binet Scale for testing intelligence; the latter had been rated by a group test, the Thorndike intelligence examination for high-school graduates. The application of my scale for temperamental will-qualities enabled me to explain certain inequalities between achievement and capacity. I propose, therefore, to summarize the results briefly in such a way as to show

the very definite contribution to educational diagnosis made by the will-temperament tests. In footnotes I give observations made three years later for high-school students and two years later for the college students.

Median profile of high-school students

Let us first study the record made by the high-school group. (See Profile XX, page 265.) [1] It will be seen that the medians for this group of twenty-one high-school freshmen coincided with those of the adult group for the following traits: absence of load, speed of decision, motor impulsion, reaction to contradiction, and resistance to opposition. The median score was low for the following traits: speed of movement, flexibility, motor inhibition, interest in detail, and coördination of impulses. The pattern as a whole is that of the willful or aggressive type, with a partial emphasis on the first group of traits or those which relate to speed and fluency of reaction. The general form of the profile is of great interest, since it exhibits the temperamental type with which the educator deals in his work with the high-school freshmen. Out of this specific combination of traits, such, for example, as high motor impulsion

An aggressive pattern

[1] With such a small group as the one with which we are dealing the propriety of utilizing the median in the way suggested may be questioned. But in every instance in which the group median of the high-school pupils is definitely below the median for adult scores the range of scores is considerably cut at the higher end, that is, none of the group achieves the higher scores; usually, too, the mode is the same as the median, although this does not hold true in the case of care for detail. Where the median coincides with that of the adult scores, the distribution is fairly symmetrical except for motor impulsion and assurance. A bigger group is necessary for definite establishment of the central tendency.

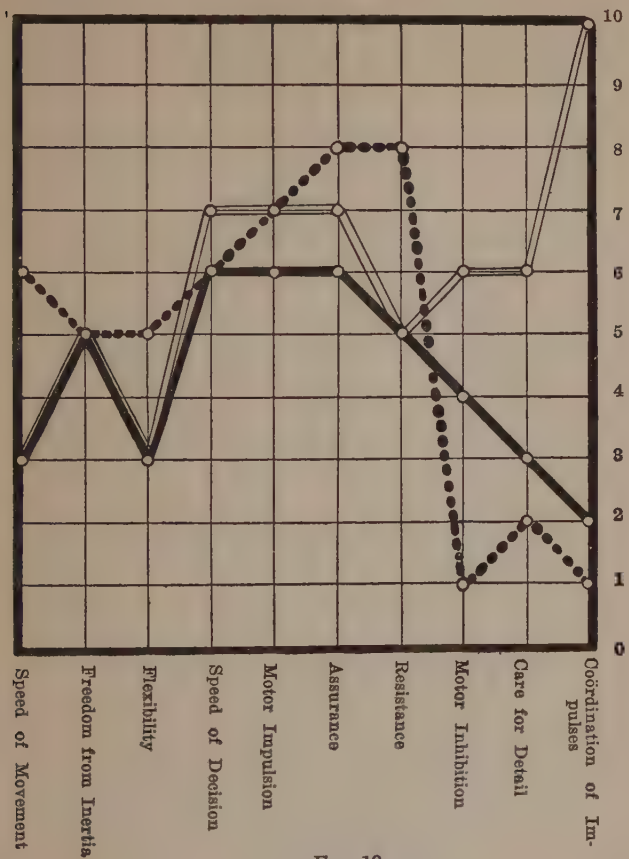


Fig. 18
(Profiles XX, XXI, and XXII)

and low inhibition, arise many of the disciplinary problems of this period.

Profiles of individual pupils

But within the group itself several patterns may be differentiated. These individual profiles, by as-

sisting in the analysis of individual differences, may be utilized in educational guidance in a most instructive way.

In chronological age the children examined ranged from thirteen years two months to fifteen-eleven. The range in mental age was from thirteen years to some seventeen years. The IQ's ran from .87 to 1.36. In addition to this information I had at my disposal for twenty pupils an order of merit based upon grades received the same year in school work, and three arrangements for general intelligence made respectively by the high-school instructors in science, modern languages, and mathematics.

Two individual profiles, XXI and XXII (page 265), are presented with the one representative of the median scores. They represent cases of particular interest. Let us first consider Profile XXI, that of the boy who gave the highest general score on the profile as a whole. This score totals 60; a much higher score than the median total, which is 43. On the face of the returns we have, then, a boy of more than average will-capacity. Specifically, he approximates the average of his group in speed of movement, absence of load, flexibility, and resistance; in every other trait he scores above the group-median. His relatively high scores are, however, at the extreme end of the graph. He excels, that is, in motor inhibition, care for detail, and coördination of impulses. This gives us a picture of a careful, dependa-

ble boy of great self-control. Let us now turn to the report on his case. So far as his IQ (1.09) is concerned he ranks ninth in the group of twenty; his grades entitle him to second place; his teachers agree in placing him sixth in the group. One's anticipations are confirmed. Such a student, because of his industry and volitional force, will accomplish more than can be accounted for on the basis of his general intelligence.[1]

Profile XXII is obtained from a girl. She also ranks higher relatively on the will-profile than in general intelligence. Her IQ (1.02) places her twelfth in intelligence. In total score on the will-temperament she made 48 and tied with another pupil; her rank is 7.5. Her pattern is very unlike that of graph XXI. In speed and fluency of reaction this girl equals or exceeds the median of the group, and she scores high on motor impulsion, reaction to contradiction, and resistance to opposition; but she is low on motor inhibition, care for detail, and coördination of impulses. The picture is that of a willful, determined girl, lacking in control and stability. It is not surprising, then, to find her ranking fifteenth for grades. Nor is it unexpected to find considerable difference of opinion in the ranking of her by teachers. The teacher of science gives her a rank of 7.5; the teacher of mathematics, a rank of 14; and the teacher of languages the same. The

[1] Left high school in his third year. Was impatient to go to work. Possibly he matured too early. This case was discussed in preceding chapter (see page 251).

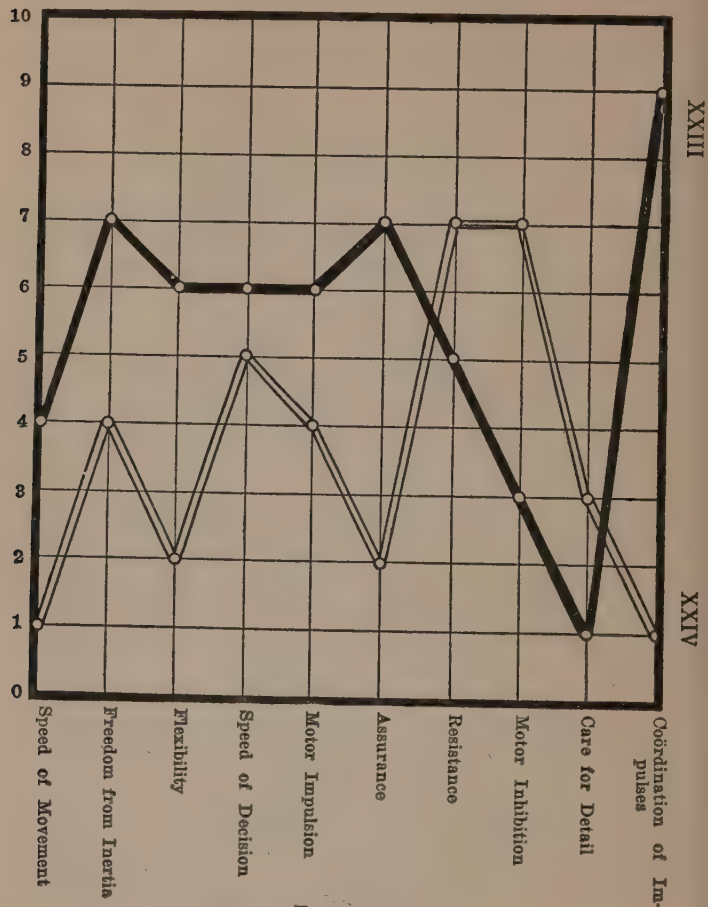


FIG. 19
(Profiles XXIII and XXIV)

willful nature of the girl makes her something of a problem in the home.[1]

[1] This girl is reported, two years later, as much more amenable to discipline.

In further illustration I may give the profile (XXIII, page 268) of the child with the highest IQ, who is chronologically the youngest and mentally the oldest of the group. Her total score on will traits is 55, considerably above the group median. Her grades place her first in the group, and in the opinion of the instructors in science and mathematics she has the highest general intelligence of the class. Her instructor in French places her second. She belongs to the quick-reacting, aggressive type. At present she is below the median of the group for power of motor inhibition and in care for detail. If mental age, rather than chronological age, be considered, she is definitely short on these traits. She is, in fact, an excitable, nervous, very charming girl, with a slight speech defect.[1]

On the same plate is plotted the will-profile (XXIV) of the member of the class with the lowest IQ (.87). Mentally he does not quite make thirteen years. His grades give him eighteenth position among the twenty. His science teacher ranks him sixteenth in the group, but the other two instructors place him at the end or next to it. Apparently he is utilizing what capacity he has, since he is more than holding his own against his neighbors in the group who rank quite a little higher in general intelligence. His profile indicates a slow-reacting but tenacious temperament which may bring him a

[1] Has continued to do brilliant work in school, but is exceedingly self-willed and refuses to follow prescribed courses that do not interest her or if they involve persistent application. The same willfulness is shown in social matters.

measure of success if he decides upon the right sort of life work and is given careful training for it.[1]

Thirty-four college students given the Thorndike intelligence and the will-temperament tests

In the college cases which I propose to analyze, the intelligence test given was the Thorndike intelligence examination for high-school graduates, issued in the fall of 1919. The students examined were all, presumably, graduates of accredited high schools, but it was ascertained later that in a few cases there were great irregularities in preparation. For my purpose, 100 freshmen were classified into the four groups suggested by Thorndike: Group I, those who might be safely admitted into college in spite of gross deficiencies in preparation; Group II, those able to do good academic work; Group III, those with enough intellect to attain a college degree if they are earnest and industrious; and Group IV, those who are unsuitable material for a college education. I had hoped to give the will-temperament test to all of the 100 students; I was able to give it to only thirty-four, selected from each group as follows: Group I, 9; Group II, 8; Group III, 6; Group IV, 11. In Groups I and IV, students making the extreme records were selected, the highest for Group I, the lowest for Group IV.

With such a small group at my disposal, I shall not attempt an extensive treatment, limiting myself to a brief summary of the academic achievement for the first two quarters of the year 1919–1920 in the

[1] Has stayed with his class and at time of its graduation was listed with it although he must complete a few more hours' credit before he will receive his high-school diploma.

light of the two examinations, one for intelligence, the other for will qualities.

Only one student in Group I failed to do satisfactory work in his college classes. His failure cannot be attributed to a low will-temperament score, since he makes 73 on the test. The pattern suggests, however, a troublesome organization, much emotional blocking, definite inhibitory tendencies, and lack of finality of judgment. It is probable that this student is the most original of the group; he is pronounced brilliant by some teachers, rated as "slow" by others, but described by all as erratic. He possesses unusual literary ability.[1]

Three of Group I give will-profiles below the median for total will-score. This lack of forcefulness shows more evidently in social than in academic leadership.

Group II gives one case of very unsatisfactory work. The total will-temperament score is only 53, a score low enough to suggest an explanation for failure in college work. The pattern, moreover, suggests inertia, lack of interest in detail, and little perseveration.[2] The other students in this group give low totals for the will test, but in their case the deficient scores relate more definitely to socially ag-

[1] During his sophomore and junior years this student "came back" strongly after changing to a course more in line with his interests. In addition to carrying the regular allotted hours of college work with passing grades, he held down an eight-hour job which brought him in an income more than sufficient for his college expenses.

[2] This student dropped out of college at close of his freshman year, with a very unfavorable reputation in more ways than one.

gressive traits. Life, not college, must prove the adequacy of their rating.

In Group III, in which character traits are cited as the determining factor in success, we find three students who are successful, three who are failing. The failures give a low score for the test as a whole; the successful students present a picture of the plodding, tenacious type.

Of Group IV, only three students are doing fairly satisfactory work. All have will-scores above the median. Two of them are very active in college activities.

With students of average or inferior intelligence, temperamental traits decisive

We may summarize in another fashion. Students with a high intelligence rating but a low will-temperament score usually succeed academically, although not to the degree warranted by their intelligence, and, with certain combinations of traits, may fail. Students with a low will-score, who are rated in either Group III or Group IV for intelligence, fail to make good as students. Students of inferior intelligence but strong temperament qualities may succeed in maintaining a passing grade.

Let us now study a few individual cases:

Case I. Here we have the student who ranks first of the 100 freshmen on the intelligence examination. His will-temperament score places him eighteenth in the selected group. His pattern is that of a quick-reacting, flexible individual with deficiency in such aggressive traits as reaction to contradiction and resistance to opposition. There is nothing in this pattern to lead one to anticipate failure to utilize intelli-

gence in academic work but much reason to anticipate inadequacy in situations where active leadership is required, an anticipation confirmed by facts. So far as grades are concerned, Case I maintains a very high rank, but he is not a leader in student activities and fails to attract attention until his ability has had a chance to win out.[1]

Case II. This is the student who ranks first on the will test, scoring 90. For intelligence she falls in Group II. She ranks eleventh in the whole group. She is an all-round successful student, making an exceptional record both for scholarship and leadership. Her pattern is a balanced one, with a slight emphasis of the first four traits.[2]

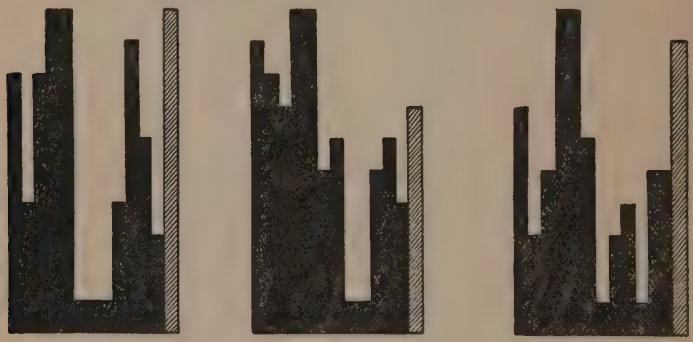
Case III. We have here the born leader; great intelligence and great forcefulness of the ready, flexible type. She ranks seventh in her class of 100 in intelligence and third in total will-profile score. She is a leader in social activities and also a winner of college honors. Her personality creates immediately a favorable impression.[3]

[1] During his college career Case I has attained a reputation for intellectual ability; he is an honor scholarship student but has not developed qualities of leadership.

[2] For financial reasons II was obliged to drop college work in her junior year, but she is earning money to finish her course. It is interesting to note that students in Thorndike's second group are unable to stand the pace or submit to the pressure that seems possible for those in Thorndike's first group.

[3] III has continued to manifest leadership and is an honor debater. She is at her best under social stimulation and should go into public speaking. Two deficiencies in her profile are reflected in her life—a lack of flexibility and a low power of motor inhibition. These traits combined with high aggressiveness may endanger her success in life.

Cases IV and V. These cases should be considered together. IV is that of an exceedingly clever girl, rated high in Group I for intelligence but ranking very low for the will-profile score, twenty-second in the whole group. She shows much load and lack of ambition and is satisfied to do work that is far below her capacity. Case V, ranking eighth in the



Case I Case V Case IV

Fig. 20

temperamental test, but considerably below IV for intelligence, definitely outdistances IV in academic rating, and in academic contests carries off the honors. Her pattern is just suited to create a favorable impression, since it shows extreme speed in reaction, great flexibility, total absence of load, and plenty of tactful aggressiveness. Her intelligence is uniformly overrated by her teachers.[1]

[1] This comparison of IV and V is still an accurate description. IV lacks force and persistence, but her extreme cleverness and her reserve of energy make it possible for her to meet emergencies

Cases VI and VII. These two cases also bear comparison. Case VI falls in Group III for intelligence; Case VII in Group IV. VI has a will-temperament score of only 55. She is excessively slow both in movement and in reaching decisions, has tremendous inertia, little motor impulsion, and little perseveration. Her college work is highly unsatisfactory; it is almost impossible to stimulate a reaction.

VII, although slow in movement and in thought, has great patience, perseveration, and power of coordination, a pattern running high on the third group of traits, and totaling 68. She has succeeded in maintaining consistently a passing record in spite of her inferior intelligence.[1]

The report on the above two groups is based on individual testing. Now that it is possible to give the group test for will-temperament, much more extensive if less accurate records may be obtained. It is a point of considerable importance to find out whether the will-temperament test in conjunction with an intelligence test will increase our power of predicting success in school life.

Educational diagnosis

For one group of college freshmen, 74 in number, the result of a group will-temperament test and of a

gracefully. V is an honor student in scholarship, an honor debater, and ranking officer in a number of clubs, but in her three years of college life she has pretty thoroughly exhausted her supply of nervous energy. She is the type that modern college life exploits to the limit.

[1] VI dropped out of college before the close of the first year, with a bad record. VII continued the second year and earned a teacher's certificate. She has also returned for summer school work.

Thorndike examination are at hand. Since there were some inaccuracies in the giving of the group will-profile test, only meager statistical manipulation will be attempted. In order to get a crude notion of the relationship between each score and academic standing a correlation was obtained for the total of each test with the average grade for the first two quarters' work (1921–22). The averages were calculated for each student by multiplying the grade in each subject by the number of hours' credit it gives, adding the results and dividing by the total number of hours. Such a procedure fails to reckon with the kind of work or the amount of work a student is carrying. To overcome the possible inaccuracy inherent in the difference in amount of work it might be well to use the sum of grades rather than the average of grades. Frequently, however, students carrying minimum or less than the minimum hours are engaged in outside activities or are physically below par.

Correlation by the rank method gave a coefficient of + .40 for grades with the Thorndike examination and of +.32 for the will-profile and grades.

To determine roughly whether the combined score on both examinations would raise the correlation with grades, a rank value for each individual was obtained by taking half the sum of the rank value for the two tests. A coefficient of +.554 was obtained for this ranking and grades.[1]

[1] Through an error this correlation was reported as +.65 in an article in *School and Society* for August, 1922.

It is along these lines that future work must be directed. Each test of the twelve in the will-temperament group should be studied from the slant of its predictive value in college and academic work.

Interesting case studies could be given for this group of 74 students as for the earlier group tested, but many of the observations would be identical. The girl who makes the highest will-temperament score in 1922 has supported herself and put herself through school since her early high-school days. The man with the highest record in the 1921 Thorndike examination proved a great disappointment to his teachers because of his indifferent work. He ranked thirty-sixth in the group of seventy-four on the will-temperament total. He possesses much load —a trait frequently found with literary interest— and a very great deal of perseveration, just the individual to be obsessed by any project he gets his attention centered on. Since he possesses great literary ability, his failure to fit into college routine is by no means inauspicious.

CHAPTER EIGHTEEN

Temperamental Pattern and Quality of Intelligence

Temperamental pattern and quality of intelligence

ONE of the current criticisms of the present procedure in mental testing stresses, as we have seen, the fact that it measures the functions of intelligence only and that its investigations do not cover other aspects of human personality. Such a criticism should not, however, be interpreted as sanctioning a belief in deep-lying divisions of personality. The psychophysical organism is a unit, expressing itself in various functions which for purposes of analysis are variously named but which actually interpenetrate and color one another.

Four typical will-profile reactions

The thesis of the present chapter is that a temperamental pattern carries with it implications concerning the *quality* of intelligence, although not indicating the *level* of intelligence. To prove this thesis I propose to study the mental reactions of twenty women students of college rank classified into four groups that gave characteristically different temperamental patterns, as shown by their reactions to the will-temperament test. For purposes of identification I shall refer to the four groups by Roman numerals and cite the individuals by letters. I shall

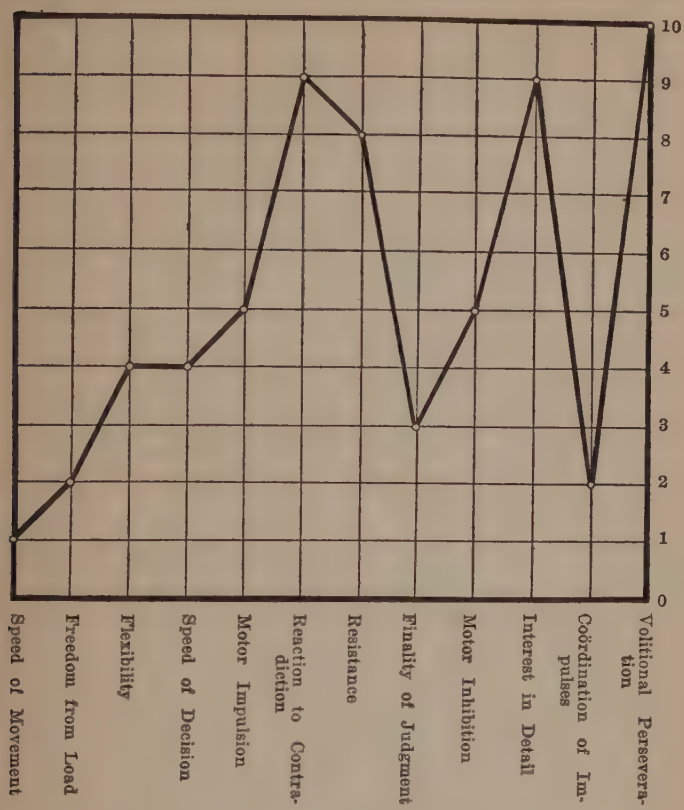


FIG. 21
(Profile XXV, Subject E)

compare the groups as a whole and give a few case-studies of individuals. After a presentation of the general matter at issue, I shall consider specifically the relation of temperament to imaginal types.

Group I is composed of five individuals presenting

Group I

clear-cut profiles of the slow, deliberate, accurate, highly controlled temperamental type: Profile XXV (page 279), from Subject E, may be studied as a sample of this type. The graphs obtained from these subjects run low for speed of movement and of decision, show considerable load and some deficiency in motor impulsion, with moderate or high power of motor inhibition, great interest in detail, and much volitional perseveration. The members of this group are non-suggestible, and resist opposition strongly but are not actively self-assertive.

Studying their mental reactions, we find that these subjects learn somewhat slowly, particularly when rote memory is involved. In attacking a problem of habit formation they are liable to think it through the first time and take an excessively long time for the initial trial, with rapid gain in speed thereafter. They possess highly concentrated but not widely distributed attention, an attention which adjusts slowly but is not easily distractible. Theirs is the brooding type of intelligence, an outcome, probably, of strong perseverative tendencies. The imagery type is very definitely visual. In the Kent-Rosanoff Association test, there is some evidence of a rather high number of individual reactions. The handwriting is carefully controlled, and very legible.

Group II

Group II gives a contrasting pattern. (See Profile XXVI, Subject H, page 281.) This group consists of five members, of whom one, F, is a variant of the type. The profiles show a quick-reacting, rapid-fire,

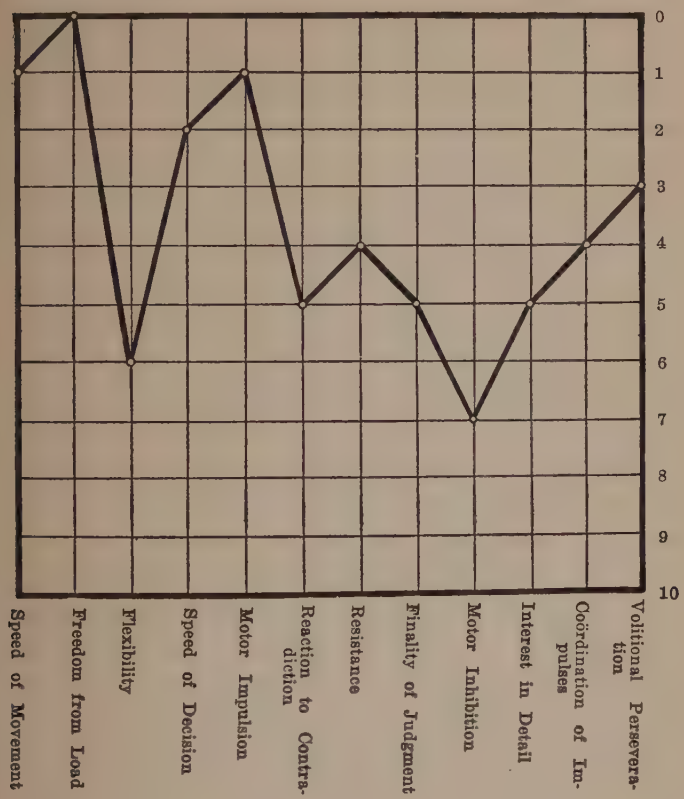


Fig. 22
(Profile XXVI, Subject H)

explosive sort of individual only slightly interested in detail, with some inadequacy on the side of motor inhibition, except F. F gives a profile high throughout, but since her preferential mental set is for speed, she is included with the mobile type. As a whole,

members of Group II are more suggestible and less resistant than those of Group I, but they assert themselves much more vigorously and show more initiative. Self-confidence is motivated by the warmth and vitality of experience rather than by logic.

On the intellectual side we have individuals who learn easily, attack a problem-situation by the method of trial and error, and usually solve it first by chance success. They warm up quickly, shift attention easily, and are readily distractible. They are given to rapid generalizations, make great use of verbo-motor material, and in association tests show dependence upon verbal habits.

The handwriting of individuals of this group is either very fluent and highly automatized or else slovenly and illegible when the desire to speed exceeds the native manual dexterity.

Meumann's types of slow and rapid learner

The contrast between Groups I and II will remind the reader of Meumann's distinction between the slow and the rapid learner. Meumann concludes that there are two fundamental differences between such learners, a difference in attention type and a difference in imaginal type. The slow learner possesses the slowly adapting, highly concentrated, narrow-range type of attention, and is predominatingly visual; the rapid learner adjusts attention easily, has a wide-range but easily distractible attention, and is verbo-motor or acoustic-motor in type. Meumann's contrasting descriptions fit our cases excellently. Further comment will be made later.

Group III consists of seven individuals of less ex-

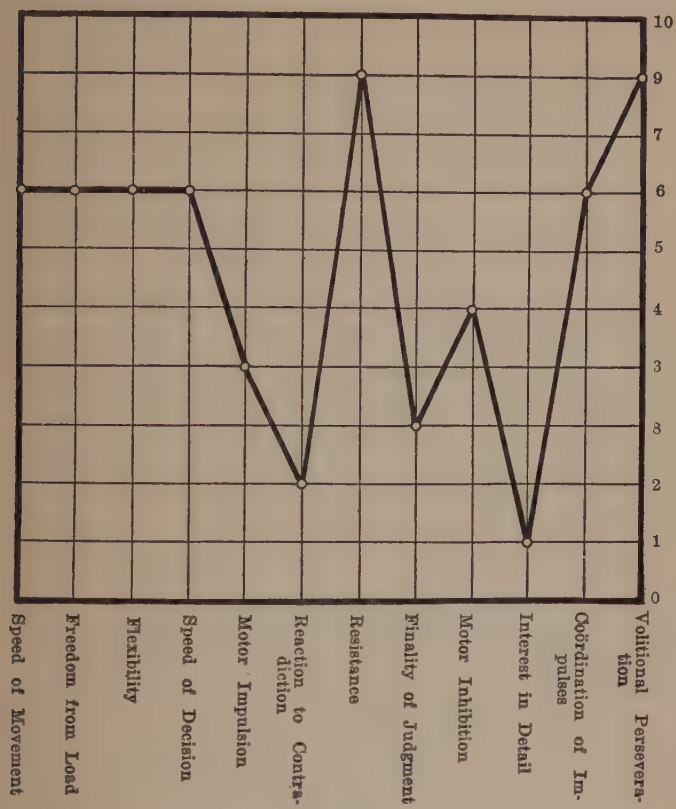


FIG. 23
(Profile XXVII, Subject Q)

treme patterns or of irregular or non-specific pat- Group III
terns. This is the type commonly described as temperamental. (See Profile XXVII, Subject Q., above.) Low interest in detail may be found in conjunction with great volitional perseveration; or

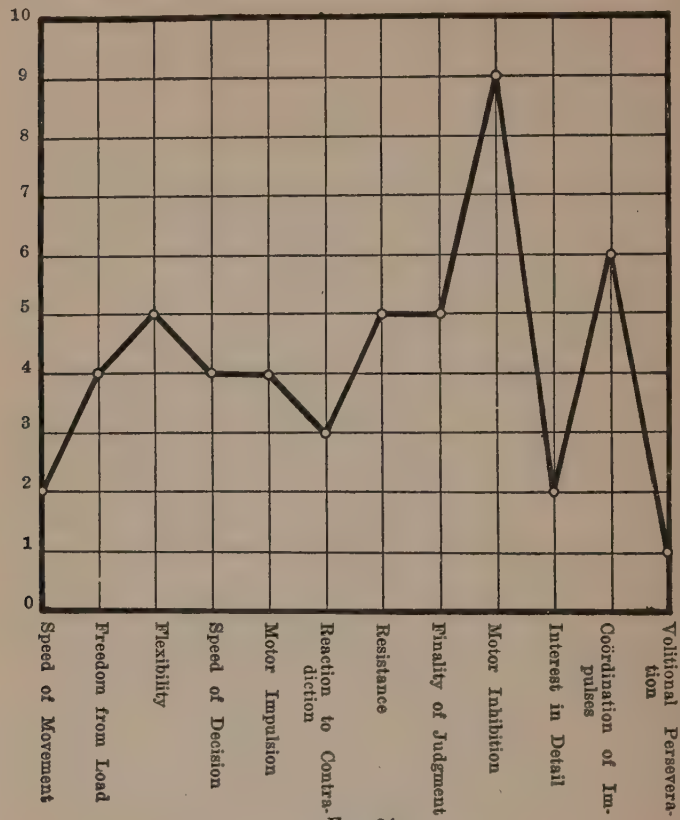


FIG. 24
(Profile XXVIII, Subject R)

quick decision with only moderately speedy movement, and fair capacity for motor inhibition. The quality of intelligence in this group is less obvious than it is in the preceding groups. There is some inconsistency in organization, with unexpected reac-

tions. Possibly there is greater versatility, with less special efficiency. Both verbalization and visualization are reported by these subjects, but the latter may show some inadequacy or demand special effort. In speed of learning this group falls between Group I and Group II. Attention is somewhat less readily adjustable but less distractible than in the case for Group II. There is greater ease in rote learning than is true in Group I.

Group IV is composed of three individuals (R, S, and T), with generally low profiles. (See Profile XXVIII, Subject R, page 284.) On the intellectual side, these individuals show a lack of responsiveness, a colorlessness of reaction, a failure in interest, that lead me to describe them as phlegmatic, if not apathetic. That there is not, necessarily, a low level of intelligence is shown by R's score of 162 on the army alpha. Her profile suggests as outstanding traits an utter lack of self-confidence and "pep." She succeeds in routine tests without much difficulty but is lacking in initiative and energy. Emotionally she suffers from a feeling of inadequacy and shows an autistic trend. She is vague, dreamy, detached. S may be described as lethargic. She does fair college work under outer compulsion but in an unenthusiastic, colorless way. T, of lower intelligence than the other two, has shown greater capacity for improvement. Possibly her low profile is significant largely of immaturity and may show considerable rise in level within a year or two.

Group IV

In Table IV will be found the score made on the army alpha by each of the subjects utilized in this study. The relative position for intelligence in the group as a whole is also given so far as determined by this test.

The army alpha

A second scoring on the army alpha was obtained by returning the record blank to each subject after the first score had been calculated and instructing her to complete the exercises. This second score represents what each individual was able to do on alpha with no time limit. Table IV gives this second score and the relative position in the group calculated on this basis. A correlation of .90 is found for the two ratings. The official report on "Psychological Examining in the United States Army" gives a correlation of .965 between a rating on alpha, with the prescribed time limit for each test, and a double time allowance for each. It reports a greater percentage gain for those making low scores in the single time allowance than for those making high scores. The results here, with a somewhat different distribution of time on the second trial, are closely comparable.

From the tabulations of Table IV it is, however, evident that Group I shows a slight tendency to gain on the other groups with increased time. This is evident not only in the positive shifts of position in relative ranking but also in the tendency toward greater percentage of gain when a comparison is made with subjects giving a fairly equivalent original score. Perseverative tendencies, disinclination to guess, distrust of the general situation and of the

TABLE IV

	Score Alpha (1)	Relative Position (1)	Score Alpha (2)	Relative Position (2)	Gain or Loss in Relative Position (2)	Per Cent Gained Score Alpha (2)	Time in Minutes for Completion of Alpha
Group I							
A	179	2.5	194	2	+.5	8.3	29
B	166	6	185	5	+1	11.5	13
C	136	12	171	12	0	25.7	27
D	131	13	174	10	+3	32.7	33
E	116	18	173	11	+7	49.1	57
Group II							
F	191	1	193	3	—2	1	.7
G	179	2.5	188	4	—1.5	5	15
H	173	4	184	6	—2	6.3	10
I	158	9	180	7	+2	13.3	23
J	97	20	132	20	0	36.1	26
Group III							
K	169	5	196	1	+4	15.9	16
L	161	8	178	8	0	10.5	11
M	139	10	163	14.5	—4.5	17.2	17
N	137	11	163	14.5	—3.5	18.9	19
O	126	14	167	13	+1	32.5	34
P	120	15	149	17	—2	15.8	18
Q	117	17	136	19	—2	16.1	20
Group IV							
R	162	7	175	9	—2	8.0	10
S	119	16	156	16	0	31.0	35
T	101	19	147	18	—1	36.5	41

surface solution, inability to let oneself go, these are temperamental factors operating in an intelligence test to the slight disadvantage of members of Group I.

The slowly adjusting individual at a disadvantage in an intelligence test

In a comprehensive statistical survey this slight distortion of intelligence scores by individual temperament is not serious. In educational or vocational guidance such individual trends are of great importance. Let us consider in some detail the case of E, who shows the most extreme shift in position, when the time limit on alpha is extended.

The case of E

In her freshman year, E made a score of only 79 on alpha. It seemed very unlikely that she would be able to carry college work. None the less, by dint of extraordinary industry, she succeeded in passing her courses for the freshman and sophomore years. At the beginning of her third college year she gave a score on alpha of 116. There is nothing vague or chaotic about E's mental processes, but she labors under the handicap of a slowness that may be described as pathological. An enormous expenditure of effort is required in her first attempt to adjust to a subject. This effort her strong physical constitution makes it possible for her to apply; her working day exceeds by many hours that of the average student. It is interesting to note her gradual increase in mental capital. One would advise in such a case a narrow range of courses, in order to permit of the formation of very specific habits, which might eventually issue in approximately average speed of reaction in a few lines of work.

The whole problem of *transfer of habit* training might well be reconsidered from the standpoint of temperamental varieties. (See page 331.) I am inclined to believe that it is only when a specific habit plays into the native tendencies that we get it generalized. Members of Group II, and some in Group III, will readily take on the general habit of speeding, whatever the stimulus, while individuals in Group I will acquire speed in a specific habit only under spur of excessive practice or unusually strong motivation, without carrying over this habit to other situations. Group I will, however, generalize training that involves a self-conscious technique, such as a particular schematized procedure in approaching a problem, a device for speedy warming-up or for striking a decision.

Generalized habit and temperamental type

To point a little further the contrast in intellectual types, let us compare B, of Group I, and F, a variant on Group II. Both are honor students of exceptional attainments.

A contrast of types

F's will-temperament test scores *high* throughout the whole range of traits. She is both speedy and accurate; and she is able to put through an immense amount of work of excellent quality. Her fourth year in college she carried a full schedule, with a major in mathematics, held a student assistantship in one department and an executive position in another. Her thinking proceeds in terms of logical relationships, carried by either latent or overt movement, quite in the Watsonian style. Audible articulation or overt hand and finger movements occur frequently.

Visual images are fragmentary and difficult to hold; auditory imagery is conspicuously absent. Problems which other subjects handle on the basis of concrete images (reversal of the hands of a clock, for instance) F solves by expert mathematical calculation. There occurs for F an exceedingly rapid mechanization of processes and a great reliance upon automatized verbal habits, so that she reaches very quickly her maximum efficiency in any line of work. With this rapid mechanization there goes, I believe, some failure in interest and in originality. F is unimaginative and matter-of-fact.

B, of Group I, cannot work at such speed or under such pressure as F, but her completed work shows greater distinction and originality. Her long preoccupation with various topics issues in subtle judgments on individuals, shrewd and humorous comments on life. B's imagery is of the Galtonian type, and centers around her detailed and persistent visualizations. Perseveration of visual content is strikingly evident. While learning stenography, for instance, B found the stenographic symbols floating above every text she attempted to read. All thinking involves eye-strain. B has a fine sense for color and form and has artistic gifts. She organizes material thoroughly, but sometimes a little too minutely. She fails sometimes to emphasize principles because of her great interest in details.

For assistance in routine work I should undoubtedly give the preference to F; to B I should turn over a problem, which she was prepared to handle, with

the expectation of getting a keen and original contribution.

Let us consider now, in some detail, the complications of imaginal[1] and temperamental type. My scrutiny of this connection has convinced me of the need of shifting the point of approach in the study of imaginal reactions. Let us first summarize the facts and then sketch a tentative hypothesis.

Temperamental type and imaginal predisposition

In order to have fairly adequate material, a number of methods for diagnosis of imagery were utilized, including the use of a standardized questionary (Galton's); introspective and timed records on spelling backwards, and on pronouncing words spelled backwards; reports on the sensory material utilized in writing words that rhyme and those that end in the same letter regardless of pronunciation; visual description tests; reasoning tests such as the Cube Test, as given by Langfeld, and the Clock Test by Terman; and handwriting tests.

The reagents in Group I (the slow, highly controlled type) are predominatingly visual. Their visual images are clear-cut, detailed, and persistent. Images of other quality may be reported, but the visual is the focus of interest.

Group I a visual group

Of the members of Group II (the rapid-fire group)

[1] Throughout the discussion the author is using the word "image" and its derivatives in a purely descriptive fashion, without taking sides in the controversy concerning the nature of the image and its physiological conditions. The hypothesis advanced may be valid, whether imagery be centrally conditioned or actually a sensation of minimal intensity due to the excitement of centrifugal sensory fibers or of residual excitement in sense-organs.

Group II a verbo-motor group

only one is visual to any extent; the others utilize either vocal-motor or acoustic-motor material, or have recourse to motor mimicry.

Group III visualizes under pressure

Members of Group III (the versatile group) report more visual material than those of Group II. Their visual imagery is fleeting and often inadequate; or else it is a rare occurrence called out by the blocking of mental processes. L, for example, writes, "I possess only slight powers of visualization but I can force myself to visualize by concentration of attention." And Q's laboratory partner reports: "Q gets fleeting visual images but so many of them and so faint that they are worthless. *If she moves or speaks they vanish instantly.*" In describing a collection of objects seen for only fifteen seconds, the members of this group list them from visual flashes but are frequently unable to recall the spatial relationships. They often name the objects in haphazard order.

Group IV visualizes in limited range

The members of Group IV use visual imagery as the focus of interest.

Meumann, as stated before, found that visual tendency was one characteristic of the slow learner. So far as Group I is concerned, this conjunction certainly holds.

But how meet the criticism that not all visualizers are slow learners? Dr. Angell in his report on *Methods for the Determination of Mental Imagery* (footnote, page 71) writes:

> Several experimenters have commented upon their observations that visualizers tend to learn more slowly than

audiles. The experiments carried on in the Chicago Laboratory have not confirmed this generalization. Several of the quickest learners have been visual and no general results have been reached which substantiate this view.

Let us begin, not with the statement that visualizers learn slowly but with this, that those who learn slowly are visualizers, and relate this fact to the unusual amount of load or tension in the nervous mechanism of slow learners.

Nervous inertia may result in slow learning and visual preoccupation

That visual mechanisms have greater inertia than the auditory, for instance, is shown by the different persistence of sensory after-effects from visual and auditory stimulation. The lag of visual sensation makes the moving-picture move; the discreteness of auditory sensations creates telegraphy.

Possibly visual imagery develops more slowly than other forms of imaging and gets a chance to serve as the main cue for thought and action only in those instances in which "load" is present. Visualization, slow adjustment of attention, and slow learning might all be the outcome of general nervous inertia. Visualization might also occur in flashes in conjunction with rapid mental tempo, or in an undeveloped form, in which case one has the feeling of latent imagery.

Visualization outcome of voluntary retardation of nervous discharge

My tentative hypothesis is this: Retardation of discharge tendencies in the nervous system gives a chance for visual images to develop. One may then expect to find precise and persistent visualization in the case of those individuals who exhibit an unusual amount of nervous inertia or load. Voluntary retardation of motor discharge may also result in visu-

alization, while fragmentary and evanescent visual images may be reported by individuals who show average load or average motor control.

The slow, deliberate temperament will be predominatingly visual, except for highly mechanized situations. The extreme rapid-fire type of person, with inadequate power of motor retardation and little or no inertia, will be predominatingly verbal in type (expressive). In the intermediate group we will find visual imagery as an accessory form. Either scrappy and fleeting images, undeveloped latent images; or, in the case of voluntary inhibition or slowing of tempo, persistent and detailed images. The person characterized by both high speed and high motor control will probably have recourse to the slowly developing image only under pressure of a problem situation, including introspective demands. Subjects giving a uniformly low record for the will-profile will report visual images, with, however, a limit in range, since their low fund of energy will narrow their interests and hence cut down the range of visual attention and consequently the range of visual imagination.

Visualization increases with fatigue or drowsiness and with inhibition of motor discharge

There are a number of incidental observations that support the above hypothesis. In her own case the author is aware that visual imagination becomes more pronounced with the onset of fatigue, drowsiness, or any increase in mental load. All hypnagogic phenomena may be similarly motivated. Visual hallucinations occur commonly on the border line between sleep and waking. The Freudians claim that dreams

are largely visual and relate this to regression to the infantile. But the predominance of visualization in child and dreamer may be due, in the first instance, to inadequate organization of pathways for motor discharge and, in the second instance, to temporary blocking of such pathways. In æsthetic enjoyment, with a failure in practical attitude and its motor sequences, visual images develop to the verge of hallucinatory vividness. Furthermore, æsthetic reverie or contemplation is itself often an outcome of relaxation induced by fatigue, emotional exhaustion or drug intoxication. With ease of motor discharge, visual imagery and, possibly, visual observations are at a minimum; with difficult or blocked discharge, at a maximum.

Behavior-tendencies a clue to imaginal preoccupations

Keen observation of behavior conveys considerable information about a subject's sensory preferences. A strongly accentuated attention of a specific type may determine an individual's whole bearing, as, for example, the auditory attention of the blind man or of the professional musician. The reference here is not merely to the motor attitude that is the outcome of the focusing of a specific sense-organ but to delicate variations in the muscular tension of the whole body. This body-set is clearly evident to the muscle-reader, where with visual fixation of attention, whether attention be focused on an object or an image, there appears in the guide a muscular tension and precision of guidance perceptibly different from the loose and rapid initiative of the verbalist guide. A similar difference in attitude is observed by experimenters

on the digit-span, who are accustomed to contrast the fixity of eye and the leisurely procedure of the visualist with the speedy response and quick relaxation of tension of one who reacts in a phonographic or motor fashion. Far from being convinced that differences in imaginal predispositions are of slight significance for differential diagnosis, I believe that we shall find subtle differences in behavior mirroring every difference in imaginal control.

In conclusion, let me illustrate the bearing of differences in imaginal type by citing the æsthetic reactions typical of each of the four groups discussed in the early part of the paper.

Group I, plastic art

Members of Group I, with a high sense of form and of spatial relationship, may be expected to enjoy plastic and graphic rather than symbolic or mystic art. The particularity and persistence of their visualizations greatly influence the type of poetry its members prefer. Figures of speech, whose value is largely emotional, dependent for their charm upon vague and fluidic imagery, seem to them grotesque and meaningless. Too closely packed images in literature cause distress. Thus B complains that reading a certain poet makes her head ache, like turning too quickly the leaves of a picture book. Stereotyping of images is apt to occur so that first reading of a poem, or a first hearing of a musical selection, gives a visualization that remains more or less constant thereafter. The group might be described as artistic, rather than imaginative.

Members of Group II, with their highly motor

responses, find particular pleasure in rhythm. There is, however, considerable fluctuation from day to day in their reactions to a given art-product. The mood of the moment determines whether or not the latter will be enjoyed. On the whole, this group is somewhat matter-of-fact and unimaginative, with practical social interests.

Group II, matter of fact, practical social interests

In Group III, one finds a number of individuals with strong literary inclination. It is possible that versatility in the employment of both visual and verbal material contributes to this inclination. There is greater freedom and less particularity in imagery, with less dependence upon objective combinations than one finds in Group I. Q, for example, is definitely fanciful. The fact that her images mirror outer reality so inadequately is part of the charm of a whimsical imagination. With little power of construction, Q is highly appreciative of art-products and finds her vague, fleeting visualizations an excellent carrier of æsthetic reactions.

Group III, literary trends, fluidic art

It is possible that the possession of a moderate amount of psychic load is something of a gain from the standpoint of literary composition, since it insures judicious weighing of words and phrases. One recalls in this connection that delightful scene in *Sentimental Tommy*, where the boy genius went down to defeat in the prize essay contest because he squandered his hour in search for the unique word, while the boy of facile pen finished his fluent composition in the proper time.

Group IV is an unimaginative group. But there

Group IV unimaginative

is a tendency on the part of its members to increased æsthetic enjoyment with greater familiarity with an art-product.

In æsthetic appreciation and creation one finds a most intimate fusion of temperamental and intellectual qualities, and exploration of this field should result in discoveries of highly practical significance.

CHAPTER NINETEEN

Practical Uses of Will-Temperament Testing

WHETHER or not the will-temperament test proposed by the author proves adequate, it must be obvious that an acceptable will-temperament test would serve many practical ends. A few possible applications will be listed in this chapter and a brief summary will be given of the actual outcome of work with the will-profile where such has been attempted.

Racial temperaments

In racial psychology important results may be expected to follow temperamental testing. How many of our conventional ideas concerning racial traits are really justifiable? Is the negro fundamentally excitable, impulsive, uncontrolled? Is the Irishman really a bit more belligerent than the Englishman? Are Japanese innately more adaptable than the Chinese? The German more interested in the detail than the American? Only elaborate statistical returns can answer these questions. Intelligence testing of different racial types has just begun; temperamental testing is *wholly* a matter of the future.

Temperamental varieties heritable?

Closely allied to the matter of racial temperament is the question of the inheritance of temperament in the family. Here we have Davenport's monograph, cited in the first chapter, as an important contribution. Davenport in analyzing family records was obliged

to draw heavily on extreme cases. Possession of the hyperkinetic temperament was proved by citation of homicidal and destructive tendencies, nomadism, hypereroticism, and brutal temper; hypokinetic temperament was evidenced by emotional depression, melancholia, and morbid worry. The tests now under discussion could be used experimentally and enable the investigator to study the inheritance of milder manifestations of temperamental overactivity and underactivity in the average family.

Medical diagnosis

It is possible, too, that the will-temperament tests might aid the physician in diagnosis of temporary conditions of depression and irritability provided that the normal reactions are known. Depressive diseases and those in which the patient is keyed up should furnish contrasting records. Imbalance of the endocrine secretions might even be revealed by such tests, as I believe was true in the case previously cited (page 142), of the girl who found retardation of writing impossible, probably because she was suffering from toxic goiter. Impending nervous breakdowns may, I am confident, be read from the will-profile in case one knows the subject's previous history and training. When a well-educated and presumably normal individual who has achieved any measure of success in life fails conspicuously on the temperamental tests, I suspect a neurasthenic condition.

Court work

Another possibility for practical employment of the will-temperament test is in court work. There are two different sorts of application that suggest themselves in this connection. The first relates to

the present-day effort to get an adequate understanding of the emotional and mental equipment of the social delinquent; the second to the possibility of using a standardized writing test as part of the professional equipment of the handwriting expert. In discussing the temperamental inadequacies of the social delinquent the author will have an opportunity to develop the suggestion of uses in court work of the will-temperament tests. At this point I should like to suggest that it would be most valuable to give the will-profile to a number of forgers, since a characteristic reaction might be anticipated.

A case cited

In one court case in which the author was summoned as expert witness, a most interesting problem was proposed, which, however, as is usual in court procedure, could be only partially handled by scientific methods.

One of two boys, Johnny and Jimmy, had forged a signature to a check. Johnny was under arrest, but the forged signature resembled Jimmy's hand. The question at stake was this: Had Jimmy signed the check, disguising his hand? Or had Johnny signed it, imitating Jimmy's hand? Asked to test Jimmy, I gave him the will-temperament test, and by means of his reactions ascertained the sheer impossibility of his disguising his hand or of producing voluntarily certain alien characteristics of the hand in question. Johnny's attorney intervened to block the next step in order, namely, the giving of the same test to his client, so that the demonstration of the serviceableness of the test was incomplete, although Johnny was found

guilty on other grounds. But the incident illustrates a possibility of introducing actual experimental work in court in certain situations where questioned documents are concerned.

It is a natural transition from court problems to social problems in general, which have received so much illumination from intelligence testing. The next step, as most authorities recognize, is a study of the same problems from the standpoint of temperament.

The feeble-minded

That low-grade intelligence may be a menace to society only in case of its association with an excitable temperament is definitely recognized by authorities on feeble-mindedness. Goddard, for example, writes in his *Psychology of the Normal and Subnormal:*

> "The sanguine and choleric feeble-minded persons are the ones who are most apt to get into trouble and be the most serious menace to society; while the phlegmatic and melancholic are less dangerous." And again: "Temperament undoubtedly plays an important rôle among the feeble-minded, determining to a large extent their social adaptation. . . . Roughly speaking, the phlegmatic and melancholic are rather easily controlled while the choleric and sanguine cause most of the trouble met with in their care."

The social delinquent

Testing the feeble-minded with the will-profile is a work for the future; I have at hand only a few incidental records, too few to cite profitably.

The delinquent who is found by the mentality tests to be not feeble-minded but who proves himself utterly incapable of handling his social responsibilities

has furnished mental testers with a perplexing problem. If not too high in intelligence he is sometimes classed with the feeble-minded by application of the so-called social criterion. This criterion involves incapacity to float oneself in society, inability to subject oneself to social control. That inability to do these things may be an outcome of a very defective will-temperament is a plausible conjecture, although the author does not yet have material to prove such an assertion. If the conjecture should be substantiated, we should be able to distinguish the feeble-willed, or better, the feebly inhibited, from the feeble-minded.

Psychopathic personalities

In the chapter on the will-profiles of psychotic subjects a number of will-temperament tests on psychopathic personalities were reported (page 210). The hospital diagnosis on these cases was, "Not psychotic, not feeble-minded; psychopathic personalities." Socially these patients were utterly unable to adjust to the demands of society; they were sex delinquents, unreliable, unstable. The will-profile indicated excessive impulsion, deficient inhibition, low flexibility, and high aggressiveness, except for one record which ran low throughout the profile. It is not difficult to see how with low-grade intelligence —not low enough for ordinary feeble-mindedness but still inferior—such individuals might be at the mercy of a bad environment or of their own strong impulses. An explosive individual of deficient control, even though he possess keen intelligence, may go down under strain; how much more liable to social

disaster is the explosive individual of weak judgment?

From a study of a number of these cases—a few of them court cases—the author has concluded that there are two types of will-profile which suggest social maladjustments when obtained from a subject inferior in intelligence. The first is the profile excessively low throughout. One expects such a person to be the victim of circumstances; the other is the profile showing high motor impulsion, low motor inhibition, high aggressiveness, and low flexibility.

Will-profile of delinquent boys

Miss Bryant's study of the *Will-Profile of Delinquent Boys* confirmed the author's anticipation in some respects although not in all. The composite profile —median scores by tests—indicates low scores for motor inhibition and for resistance, with a relatively high score on assurance. This combination of low resistance and high assurance was also found to hold for psychotic subjects (see page 214) and is in contrast to the positive correlation found in normal adults for these traits.

Motor impulsion did not run high for Miss Bryant's group. This is contrary to the expectation of the author but, of course, these expectations are at present based upon very inadequate data. As Miss Bryant suggests and as the author has stated in an earlier chapter, the operation of an age factor necessitates the establishment of norms for different ages before we shall be in a position to interpret properly the will-profiles of children and adolescents.

For 73 of the boys tested by Miss Bryant, Clark

determined the correlation of the total score on the will-profile and conduct responses. Clark has already been quoted, but the passage may be repeated. He writes:

Total will-profile score and conduct responses

The correlation of average response ratings and the score obtained in the will-profile test is —.22. This indicates a slight negative relationship between the two factors. When the relation between the test score and change in response was computed the correlation was found to be .26, indicating that boys with a high will-profile score were more likely to improve their response. It is significant that this test gave a higher correlation for all cases—negative in the case of average response and positive in the case of change in response—than the other general factors, age, retardation, intelligence, and temperament.[1]

Further experimentation with the will-profile is desirable purely from its possible administrative value as indicating to a certain extent the response that may be expected in a given case.

Clark's finding is of particular interest in connection with a statement by Porteus, in his report, *A Study of Personality of Defectives with a Social Ratings Scale*, in the publications of the Research Laboratory of the Training School at Vineland, N. J. Porteus writes:

Disobedience and disrespect for authority may indicate an active temperament and a nonconformity which resists suggestion and makes for independence. This is in line with the experience with prisoners of Dr. E. A. Doll, who states that the most obedient and trustworthy prisoners are

[1] Following Williams' classification of temperament. "Individual Case History Outline," *Journal of Delinquency*, Vol. 5.

those who become recidivists and hence the greatest menace to the community.

Possibly recidivists would be found to give a low-level profile, just as did Clark's delinquent boys who were most amenable to authority.

How a will-temperament rating can be used in the schoolroom to supplement an intelligence test has been shown in a preceding chapter. But there are other educational angles for viewing the temperamental make-up of the child. Disciplinary problems demand a broader view of personality than merely an IQ rating. If at various stages in development —the high-school period, for example—different temperamental patterns prevail, it may be necessary to modify educational methods to meet these differences. It is even conceivable that teachers of different temperamental types should be selected to handle children of different will-profiles. Obviously the aggressive high-school student will play all around the non-aggressive instructor.

Disciplinary problems

Clark's figures which show that conduct-responses in delinquent boys correlate negatively with the total score on the will-profile, while improvement correlates positively, may be brought to bear upon problems of the public school. The suggestible, backboneless individual who succumbs to discipline in the schoolroom may in the world outside succumb to temptation or to a bad environment. One wants to study the "bad boy" from all angles. Reform may be difficult in some cases, but all the more lasting because of the resistance that preceded it!

In giving boys and girls vocational as well as educational advice one should know much of their temperamental peculiarities. One needs above all to reckon with such things as aggressiveness, speed, interest in detail, perseveration. Large demands will be made upon the applied psychology of temperament when once it succeeds in establishing itself.

Popularity

Dr. J. M. Ream, in (typed report from Carnegie Institute of Technology),[1] has raised an important question: "Do we prefer to work with persons having volitional patterns similar to our own, or with those having contrasting patterns? Is one volitional type on the whole more popular than another?"

In an investigation planned to answer this question he made use of seventy-five will-temperament profiles obtained by use of the Carnegie adaptation of the Downey will-temperament test, selecting from among them two contrasting patterns, the mobile, "rapid-fire" type and the deliberate, accurate type. The names of the owners of these patterns were submitted to the members of the group with the following instructions:

Suppose you were first assistant to an agency manager and you needed three men to come into the office from field selling to help you with your work. Which three of the following list of six men would you choose? *Do not* consider their ability as salesmen, but choose the ones you would prefer to have working at desks next to yours week after week. Mark with a check your three choices.

[1] The complete report is now published. See article entitled "Temperament in Harmonious Human Relationships," *Journal of Abnormal Psychology and Social Psychology*. April–June, 1922.

He closes his report as follows:

With the limitation in mind that the results were determined only from a group of salesmen, the following conclusions may be drawn:

1. Mobile types are more popular than deliberate types. The difference in the percentage is more than three times the error of the difference.

2. Persons of mobile type prefer to work with their own type, other things being equal. The difference in the percentage is more than four times the error of the difference. The "rapid-fire" man wants fast people to assist him.

3. Persons of deliberate type are evenly divided in their preferences. As a group they like to work with either type; other factors than volitional pattern determine the choice.

In general one expects the intelligent, quick, alert, responsive individual to carry off the social honors, unless he be too effervescent and self-assured. The slowly adjusting, critical, hesitant person is lusterless by contrast. The first has his goods in the show-window; the second has stored his in the cellar (or, since brains are in question, one had better say the attic!). The one has put his talent out at usury; the other wrapped his in a napkin.

The claim has been made that intelligence testing will result in greater justice in the treatment of individuals who have superior endowment in intellect but are self-distrustful and unassuming. This may, conceivably, be one outcome of mental testing, at least in situations that permit close analysis. But social judgments will in all probability continue to be af-

fected by temperamental patterns. In school and college the ability of the quick-reacting, flexible, ready, and suggestible child and youth will probably always be overestimated; in everyday life the speedy, aggressive individual will be overrated. Given the necessary equipment of native intelligence and training, the latter will more readily acquire prestige in such professions as law and medicine than will the obstructed man who is slow to react, critical in attitude, and conservative in judgment.

Overrated individuals

When, however, the inhibited and precise individual has won a reputation through manifest achievement, his opinion is apt to carry weight beyond that of the more facile type, particularly in selected groups. His reputation for caution and certainty of judgment may be part of his stock in trade. Always, however, he will find difficulty in "selling himself" to society in general. The reputations of a group of scientists in a circle of specialists or with the public illustrate the varying sensitiveness on the part of the scientist and of the public to standards of achievement and forceful self-assertion.

Prestige

There exists some innate temperamental incompatibility between research scientist and the publicity type. The latter grows impatient with the so-called impractical, academic, dilatory methods of the laboratory man; the scientist listens with disdain to the crude, positive, and sweeping generalizations of the more active type. Some interesting paragraphs pointing the contrast between the scientific and practical attitude are contained in H. G. Wells' novel *Mar-*

Research scicntist and publicity type

riage,[1] the hero of which is Trafford, a young and gifted scientist obsessed by the marvels of micro-chemistry.

Wells quoted

He brought from his laboratory into the everyday affairs of the world the same skeptical restraint of judgment which is the touchstone of scientific truth. This made him a tepid and indeed rather scornful spectator of political and social life. Party formulæ, international rivalries, social customs, and very much of the ordinary law of our state impressed him as a kind of fungoid growth out of a fundamental intellectual muddle. It all maintained itself hazardously, changing and adapting itself unintelligently to unseen conditions. He saw no ultimate truth in this seething welter of human efforts, no tragedy as yet in its defeats, no value in its victories. It had to go on, he believed, until the spreading certitudes of the scientific method pierced its unsubstantial thickets, burst its delusive films, drained away its folly.

Trafford's wife was of a different temperament, ardent, impetuous.

"The practical trouble between your sort and my sort, Marjorie, is the trouble between faith and realization. You demand the outcome. . . . We want to understand, and you ask us to make. We want to understand atoms, ions, molecules, refractions. You ask us to make rubber and diamonds. I suppose it's right that incidentally we should make rubber and diamonds. Finally, I warn you, we will make rubber unnecessary and diamonds valueless. And again we want to understand how people react upon one another to produce social consequences, and you ask us to put it at once into a draft bill for the reform of something or other. I suppose life lies between us somewhere, we're the two poles of truth seeking and truth getting;

[1] Published by Duffield & Co., New York, 1912.

with me alone it would be nothing but a luminous dream, with you nothing but a scramble in which sooner or later all the lamps would be upset. . . . But it's ever too much of a scramble yet, and ever too little of a dream. All our world over there is full of the confusion and wreckage of premature realizations. There's no real faith in thought and knowledge yet. Old necessity has driven men so hard that they still rush with a wild urgency—though she goads no more. Greed and haste, and if, indeed, we seem to have a moment's breathing space, then the Gawdsaker tramples us under."

"My dear!" cried Marjorie, with a sharp note of amusement. "What is a Gawdsaker?"

"Oh!" said Trafford, "haven't you heard that before? He's the person who gets excited by any deliberate discussion and gets up wringing his hands and screaming, 'For Gawd's sake, let's *do* something *now!* Oh! 'Gawdsaking' is the curse of all progress, the hectic consumption that kills a thousand good beginnings. You see it in small things and in great. . . . Look at the way aviators took to flying for prizes and gate money, the way pure research is swamped by endowments for technical applications! . . . It's natural, I suppose, for people to be eager for results, personal and immediate results—the last lesson of life is patience. Naturally they want reality, naturally! They want the individual life, something to handle and feel and use and live by, something of their very own before they die, and they want it now. But the thing that matters for the race, Marjorie, is a very different thing; it is to get the emerging thought clear and to keep it clear—and to let those other hungers go."

The successful executive

Gowin, in *The Executive and His Control of Men,*[1] presents the case for the other type of man—the railroad president, governor, bishop, and university presi-

[1] The Macmillan Company, New York, 1915.

dent, although recognizing the co-leadership of the intellectual type—author, scientist, artist, historian, philosopher. He writes:

> Such executives ordinarily are *not* typified by the musing Hamlet. The impulsive Moody, the freedom-loving, unchastened and romantic Garibaldi, the jovial William the Silent, the Cromwell who impressed strangers as if he "hath taken a bit of wine too much," the cheery, exuberant Clay, the strenuous Roosevelt, represent action, not the obstructed will. They have not inhibited decision in order that the intellect might wander in a maze of speculation but rather their wills react healthily. As Lord Palmerston wrote, apparently explaining his own procedure: "I believe weakness and irresolution are, on the whole, the worst faults that statesmen can have. A man of energy may make a wrong decision, but, like a strong horse that carries you rashly into a quagmire, he brings you by his sturdiness out on the other side."

Again:

> Complete knowledge before every decision is indeed only a dream of the future; meanwhile we must act. In the twilight zone, one follows the light he has. Henry Clay, after examining a question in only a surface manner, readily espoused one side of it, persuaded of the absolute correctness of his own opinion. He no doubt represents initiative overdone, but he inspired followers with a ready belief in his own infallibility and accomplished much while others were merely agreeing that the question was complex.

In my collection of will-profiles some very characteristic differences appear between those who are successful executives and those who are particularly successful in research work.

The successful executive runs relatively high on speed of movement and of decision, freedom from load, motor impulsion, reaction to contradiction and opposition, and finality of judgment. Flexibility is the one speed item which need not be emphasized in his profile. It is all the better if his high-speed scores are balanced by good records on motor inhibition and coördination of impulses, but it is questionable whether it is an advantage for him to score high on interest in detail and on volitional perseveration. According to Gowin, "Too minute attention to details buries the executive beneath his organization; ignoring all details, he becomes an alien outside it." Too great preoccupation with details might cause him to hesitate to turn over to another the handling of subordinate matters, while too great perseveration might make it difficult for him to turn from one problem to another, to dismiss each question from consciousness —a decision once reached—and focus all his energies on the next one.

The research man

The research man may properly be autistic in type —preoccupied with his own interests and oblivious to passing demands on his time and attention. He needs a high degree of volitional perseveration and interest in detail, and may well be slow and critical in judgment, with a tendency to revise his decisions with the possession of new data; he may have so much load that he finds it painful to shift from one thing to another. The flight of time should not impress him unduly. Of course, such a make-up might insure success only in a narrow routine task unless it

be accompanied by the gift of imagination which gives the deliberate, critical temperament its creative spark. The most eminent scientist of all my scientist subjects gave in general a slow, deliberate reaction, but he ran excessively high on flexibility. Perhaps flexibility is the final grace of the accurate thinker; its emphasis in a generally slow reaction type is somewhat unusual. But in all interpretations of will-profiles the combination with intelligence should be kept in mind, and for research work fertility of mind should lighten temperamental rigidity.

The literary temperament

The author has a feeling that the literary temperament may give an irregular will-profile, possibly one suggesting inconsistencies in organization or, even, instability. Such evidence as exists for this conjecture has already been given in the chapter on "Temperament and Type of Intelligence" and need not be repeated here.

If the will-temperament test succeeds in validating itself, it will undoubtedly be of great help in industry in conjunction with intelligence and special ability tests in fitting men to jobs. Anything that the author might say on this topic would be premature, since it would consist in conjectures which must be tested out. In the selection of salesmen Dr. Ream [1] speaks of its already demonstrated value.

Captain Dockeray's conclusion relative to the most desirable personality for aviators is in point here.[2]

[1] *Journal of Educational Psychology*, Vol. 13, 1922.
[2] *Loc. cit.*, page 147.

As to the personality of the aviator, it seems that no general rule can be laid down. Quiet, methodical men were among the best fliers. What seems most needed by the aviator is intelligence; that is, the power of quick adjustment to a new situation and good judgment. He need not be so quick in *motor* adjustments, provided he thinks clearly or makes quick *mental* adjustments. The nervous, high-strung individuals, or those bordering on the temperamental, are least reliable, for though they often become good fliers, they are the most liable to become psychotic under strain.

In this connection I may cite a most interesting will-profile obtained from a successful aviator, a young college student. The curious feature of the profile was a score of 10 on speed of movement and a score of 1 on freedom from load. This meant that the young man ranked without effort as one of the speediest group; under pressure his possibilities of speeding were record-breaking. His usual attitude was one of relaxation, with great reserve forces ready for an emergency.

Social leadership

It appears that social leadership is the gift of the mobile type who have leadership thrust upon them or assume it without outer compulsion; it does not follow that the contrasting temperament may not produce most excellent leaders, particularly for long, hard, involved campaigns where endurance counts for more than brilliancy; but such leaders await the call to service rather than initiate it. The mobile temperament, if at all clever, creates a favorable first impression, a much more favorable one than the inhibited type does. If the first impression is to be a

A favorable first impression

great factor in success, then the mobile ready person should be chosen for the task. In many situations the "last" impression is the only important one, and when this is the case, speedy adaptability is not necessary.

Good judges of character

Is there any quirk of temperament that makes one just naturally a good judge of character—or a poor one? It would be a great thing if one could say, "If you are low on this trait or high on this trait, you are probably a poor judge of character."

The author's experiment on identification of will-profiles (Chapter XII) indicated as one outcome that the somewhat obstructed person was a more accurate judge than the highly mobile type.

The impulsive type of person reads others with great rapidity and with great confidence in the accuracy of his judgment, which he expresses freely. But he is under too great compulsion from his own ardent temperament to make it possible for him to weigh very carefully the complexities of the human make-up. Disliking the reserved cast of countenance, he misses the subtle humor that lurks behind it; or, responding to another's warmth of interest, he overlooks its superficiality.

There are, I believe, two temperamental types that issue in native skill in character-reading.

The first one is the dramatic make-up, which is dependent upon facile identification with others, a possibility which in turn is the result of unconscious mimicry of the attitudes and expressions of others. Suggestibility and flexibility contribute to this make-

up. It is this type of temperament which enables an individual to catch the spirit of the crowd, to play up to it. In practical life this person has "character-hunches" if a man; or character-intuitions, if a woman! But his conclusions are frequently more valid than his reasons, which are usually invented as an afterthought. None the less, the speed with which he reacts to another and the confidence with which he does it may be immensely valuable in emergencies, even though his reaction may occasionally be wrong.

Many executives poor pickers of men

The second make-up that mediates skill in character-reading is that of the inhibited individual with an innate interest in personality types, motivated possibly by extreme introversion. His analysis is detailed and subtle; many times revised. He frequently keeps his discoveries to himself. Conscious of his own deficiencies, he hesitates to invite criticism by being critical.

In future work on the will-profile, the possible combination of low motor impulsion with high flexibility as a possible index of all-round capacity for character reading should be kept in mind. It is easy to see why there is something in a lot of executives that makes them poor pickers of men—just not good on human character. They are apt to be too rapid in reaching decisions to wait for sufficient evidence, too assured to revise the first judgment, and frequently too inflexible to catch another's point of view. Executives of this type need all the help they can get from character-experts.

With the perfecting of the will-temperament test,

experiments on the accuracy with which individuals read temperamental varieties may be made and a rating given them. Training in character-analysis may also be given when once a usable technique is at our disposal.

So far as the social rating of personalities is concerned, the time may come when temperamental tests in conjunction with intelligence tests will spot in advance the false leader who places himself at the head of the procession and leads it into the ditch. So far as one can see, there is no correlation between ability to lead well and willingness to assume leadership, and people need to be taught to distinguish between mere political and social activity and leadership that means insight and progress toward a definitely set goal. Hasten the day when it will be said of the arrogant but stupid leader, "He has only high motor impulsion and great assurance and really doesn't know anything about the matter!"

CHAPTER TWENTY

The Will-Profiles of Celebrities

SOME months ago the newspapers headlined the spectacular record on intelligence tests made by an ex-service man in vocational training. He possessed—the press asserted—one of the twenty-five greatest minds in the United States of today.

"And what," queried the skeptic, "besides passing a high intelligence test has he done to prove it?"

Achievement in life

The proof of the pudding is in the eating, and this proverb applied to mental testing would be translated by the everyday man as follows: "Do those who make the highest records on tests also make the most money, occupy the highest positions, and achieve the most notable successes?"

Supernormal children

Estimates of the superiority and inferiority of school children remain as yet guaranteed largely by success in school. Mental testing is too recent a movement for us to know how far achievement in life is to be anticipated from superior mental alertness in childhood. But records are being kept of the scores on intelligence tests of supernormal children, and ten or twenty years from today we shall know how many child-prodigies achieve eminence and are justly entitled to be called geniuses or near-geniuses.

Professional success

Some effort has already been made to measure the value of high adult rating on the current scales by finding the extent to which this correlates with professional or financial success. If the latter measure

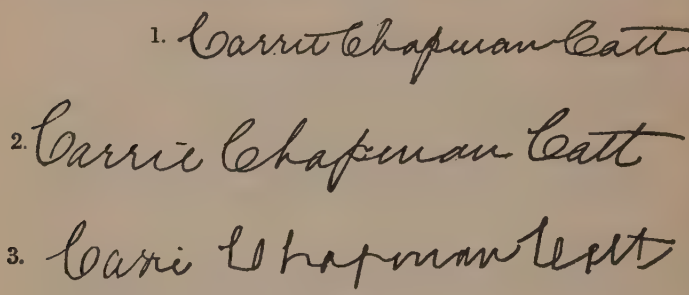


FIG. 25

1. Normal signature.
2. Signature under distraction of attention.
3. Signature written under opposition (pen point blocked).

is used, only individuals within the same trade or profession may be compared, since the monetary rewards vary so widely in different fields. Even in branches of the same profession the same statement holds true. Among medical men, for example, specialists on nervous and mental diseases make the highest intelligence scores; but surgeons make the most money! On the whole, however, high rating on an intelligence scale has proved to be one factor contributing to worldly success. But the tests are as yet by no means adequate to testing the higher ranges of intelligence. The scales contain no devices for selecting individuals who in addition to mental alertness and efficient functioning of the simpler mental processes possess also the rarer gifts of great synthetic

and originative capacity. They are checking out certain minimum essentials for achievement, rather than accenting the maximal powers of mind.

1. Abraham Myerson

2. Abraham W. Myerson

3. Abraham Myerson

FIG. 26

1. Normal signature.
2. Signature under distraction of attention.
3. Signature written under opposition (pen point blocked).

The will-temperament test and eminent subjects

While establishing norms for the will-temperament test, the author had occasion to get records from twenty men and women who are eminent enough to be included in *American Men of Science*, in *Who's Who*, or both. One is a woman of international reputation; several are starred men of science. Just as is true for intelligence testing, namely, that we are measuring minimal essentials and not maximal possibilities, so in will-temperament testing no attempt is made to tap the highest reaches of personal force. A tenfold grouping does not permit more than a rough classification. None the less, the profiles obtained from this group afford interesting observations.

In general, the total score on the will-profile runs high—an indication that achievement of recognized

success is in part due to the possession of a forceful personality. Nearly three fourths of the group gave a consistently high profile but with relative emphasis of either speed *and* aggressiveness, or carefulness *and* aggressiveness. It is high aggressiveness, particularly high motor impulsion, which gives force both to the careful and to the speedy reaction. To show the remarkable degree of impulsion exhibited by certain members of this group, reproduction is given of the writing obtained from two subjects under distraction of attention. (See Figures 25 and 26). Many of the group also give an extraordinarily strong reaction to opposition. When an obstacle is placed in the path of their moving pen, their writing increases in size, pressure, and firmness in proportion to the opposition exerted by the examiner. Reproductions of the reactions to opposition of the same two eminent subjects who gave us illustrations for high motor impulsion are given in the same cuts (Figs. 25 and 26). To mark the contrasting reactions in rather colorless individuals, two wavering reactions are also reproduced (Fig. 27).

A number of this group of eminent persons show the combination of very high scores on both motor impulsion and motor inhibition which the author believes to be an outstanding combination; it suggests a powerful machine under fine control. It is interesting to note in this connection that the women of my eminent group, with one exception, gave notably high scores on motor inhibition. It is quite probable that physical endurance has much to do with a woman's

success in the world of affairs and that her capacity for motor inhibition tests this out to a certain extent. Since it is at this point that women are most fre-

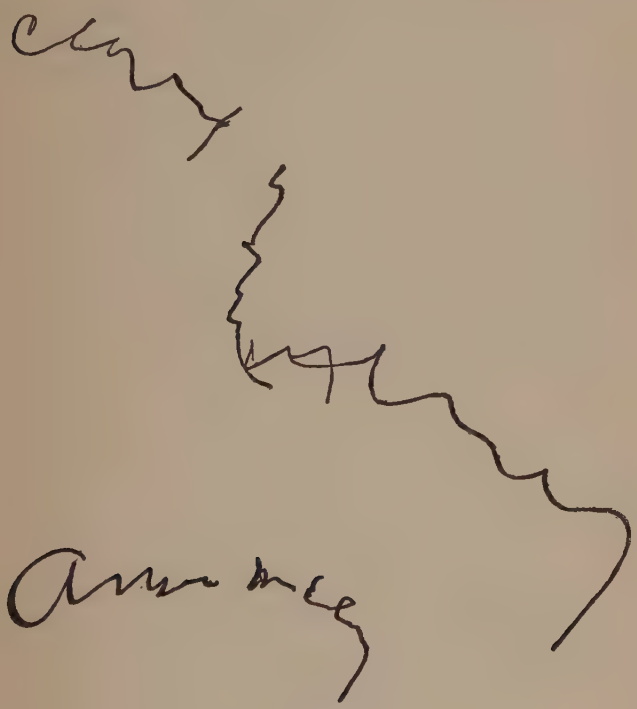


Fig. 27.

quently at a disadvantage, ability to equal a man's maximal score in motor inhibition is a distinct asset.

While the aggressive profile characterizes the majority of my eminent subjects, there are a few notable exceptions. There are three slow, careful, non-aggressive patterns in this collection: one profile

that suggests a rapid-fire, non-aggressive, and non-accurate type of organization; and there are two irregular profiles. The greatest scientist in the group shows a slow, deliberate, non-self-assertive profile but with a surprising peak for flexibility which has already been commented upon in another connection. It is possible that for this group of unaggressive men a very superior degree of intelligence must be assumed in order to overcome the handicap of lack of self-assertion and of self-confidence. It is probable, however, that concentration on their work is more easily achieved by them. The all-round man is more apt to find his energies diverted into organization, propaganda, and public work.

CHAPTER TWENTY-ONE

Constancy of the Will-Temperament

THE conclusion that one's intellectual endowment is a quantity fixed by birth[1] has been pretty generally accepted, even though in some quarters the assumption that the attainments of each individual are limited by his native endowments makes all "mental testing" seem the most dismal of the sciences. In the matter of original capacity ignorance is supposed to be not only blissful for the majority of us but beneficial for all, since it insures greater effort to attain on the part both of average and of superior individuals. It fosters, in the one, boundless hopes; and, in the other, becoming modesty!

Native endowment

Whatever the general public may feel in this matter, many educators are definitely emphasizing today the need of discovering the native endowment of each child and of so planning his training that he does not sacrifice possible achievement to nebulous ambitions. Others, driven from their faith in a limitless intellectual capital with which to work, fall back upon a belief that "character" at least is completely within their capacity to create. Since "character" may be defined as the sum-total of native and acquired re-

Limits to character-training?

[1] The reference, of course, is to one's maximal capacity, which in life one may, for various reasons, fall short in using.

actions, there is some justification for the confidence that by control of the situations which call out motor reactions until very specific habits have been acquired definite "character-reactions" may be established.

Conditional responses

Probably the most important investigation today, so far as character training is concerned, is that which centers about the problem of the conditioned reflex, or the transfer to another stimulus of a response originally called out by the native stimulus for an inherited reflex or instinct. For example, the increased secretion of saliva which follows the presence of food in the mouth may with experience result from the sight or odor of food, or from the presence of an object that has become intimately associated with the sight of food—a blue light, for example. How definitely certain conditioned reflexes have been established by manufacturers of candy and delicious wafers! The mere sight of the pretty seal and ribbon or of the checkered pasteboard starts our mouths watering! Transfer of emotional reactions is a matter of daily occurrence. Through association with situations which naturally evoke sorrowful emotions, black crape and tombstones may themselves become sad objects. Our grief might just as well have been transferred to flame-colored chiffons and circus posters—and sometimes it is.

A knowledge by parents and educators of the stimuli that call out instinctive and emotional reactions natively and of those that call them out because of some connection early made with the original stimulus will do more to solve "moral" problems than

the most eloquent exhortations from pulpit and press. We should learn how to condition moral appeals so as to give them the motive power of native instincts.

The variety of instinctive responses and the situations that call them out by nature can be accurately determined only by observation of infants in hospitals where their daily routine is under the absolute control of the investigator. Determination of these original stimuli for emotional and instinctive acts and of the possibilities in the way of associating them with situations that have been developed under modern conditions is the great research problem fundamental to a scientific treatment of the practical problems of character-training.

Native tendencies to reaction; sensitiveness of the organism in registration of impressions

The extent to which the parent or teacher can create the type of character that seems to him most desirable is limited by two things: (1) native tendencies to reaction, and (2) the sensitiveness of the child's organism in registration of connections. In the first chapter (page 5) we had occasion to raise the question of the varying strength of different instincts in individuals. If the instinctive equipment of individuals varies to any extent, this variation sets a limit to the character-training of a child in any particular direction. Again, the sensitiveness of the organism in registration of impressions is fundamental to the varying ease with which different individuals learn, and therefore influences the acquisition of conditioned responses and the breaking of them as definitely as it does the acquisition of a language or a lesson in geography. At this point we

find intelligence and character-formation dependent upon the same organic trait; namely, nervous impressionability. Parent and educator are not, therefore, given a completely free hand even in character-training, although possibly their achievements here are more creative than is true for intelligence.

Experimental evidence of character-training

Voelker, in his study of *The Function of Ideals and Attitudes in Social Education*, sought to develop an experimental series of tests for trustworthiness, in order to have at hand some way of determining the extent to which a specific character trait could be developed by such training as an efficient leader gives to the Boy Scouts who are under his direction. He concludes that scout-training, particularly when one ideal is emphasized in clear-cut fashion and there is fine leadership, is able to accomplish much in development of character, and he quotes in support of his conclusion Thorndike's opinion that:

> Morality is more susceptible than intellect to educational influences. Moral traits are more often matters of the direction of capacities and creation of desires and aversions. Over them education has a greater sway, although school education, because of the narrow life of the schoolroom, has so far done little for any save the semi-intellectual virtues.

Intelligence level was found by Voelker to play a part with regard to the ease with which ideals could be created and attitudes inculcated. But such a result was, of course, to be anticipated and does not in any way invalidate the positive evidence of character-

training. Goddard, in his *Efficiency and Levels of Intelligence,* has called attention to another phase of relationship of intelligence and temperament, when he asserts that level of intelligence has much to do with the extent to which temperamental peculiarities interfere with efficiency. He says:

> While it is probably impossible to get away completely from one's temperamental handicaps, yet like most handicaps it is usually possible for intelligence to find a way around them.

Since character is, in part at least, dependent upon the energy output or the dynamic pattern, the problem of its training involves two questions that definitely concern us in our present discussions:

Will-temperament and training

(1) To what extent is the will-profile determined by training; to what extent determined by native endowment?

(2) If it be largely determined by native endowment, how far is it constant, presenting from year to year the same specific pattern or lack of pattern?

The author cannot, of course, answer either question at the present stage of the investigation of the will-temperament. But a few suggestions as to possibilities may be thrown out.

It is probable—as shown by Davenport's investigation (page 299)—that temperament is inherited in accordance with certain definite but highly complex principles. One might, however, starting with a specific will-profile, watch the effect upon it of a training planned to correct certain temperamental

inadequacies. I have in mind, for example, a child of twelve who gives a will-profile of the careful, deliberate pattern. He is an excessively slow-reacting, "loaded," careful child, who does fine but never brilliant work, is thoroughly reliable but never spectacular. Would it be possible to speed up his reactions? decrease his load? increase his flexibility and power to handle a complex situation? One suspects that some modification of his behavior might be attained through very intelligently directed training, but the assumption has not been put to a test.

Maturity

The author, during a number of years' experimentation, has observed interesting changes in the scores on certain traits of the will-profile on the part of young college students. Shall we attribute these changes to increasing maturity or to college training? I should be inclined to accept the former alternative, but in no dogmatic way. Readers who are interested in educational psychology will realize that we are skirting a problem that has motivated a great deal of experimentation—the problem, namely, of the spread of practice effects and of generalization of specific habits.

Generalization of specific habits

The existence of a will-temperamental pattern natively determined, as the author believes, indicates that a specific reaction may reveal a general tendency: is it also true that specific training may have general consequences?

Educators have swung from a dogmatic faith in the creed that all training is general in its applications —the doctrine of formal discipline, which, since the

days of Plato, has been used to justify a prescribed course of study—to extreme skepticism concerning a specific habit functioning at all in any general way and have urged the acquisition of numerous specific habits as the educational goal. Experimental investigation has somewhat modified the views of both extremists and has revealed the very great complexity of the problem. We are yet far from a scientific solution of the question at issue, but we are rapidly learning the most promising points of attack.

Temperament and generalized habit

One possibility that has been ignored but which the author believes to be worth investigation is that different sorts of personality respond to training with such fundamentally different attitudes as to make it probable that generalization of habits may proceed along somewhat different lines in different temperamental types. This point, which was raised on page 215, will bear amplification here. It may be true that definitely patterned types of the will-profile generalize a particular kind of training only when it plays into the native tendencies. The rapid-fire type, for example, will carry over into all situations a habit of speeding acquired in the schoolroom. Carefulness in a specific performance may be enforced but will not be generalized. The deliberate type, under spur of excessive practice or strong motivation, may learn to speed up a particular activity but will not on that account change the usual performance rate. But such an individual may generalize all attitudes that involve a suspense of judgment or those that depend upon a self-conscious technique.

Training should, then, be in part formal and in part specific. Where speed seems essential, the deliberate type must be trained to it by excessive practice; where detailed analysis is important, the mobile type must be given strong motives to slow down. From recent investigations it appears that, on the whole, it pays in school and college to be speedy rather than accurate in work. In the long run the mobile type suffers by the failure to acquire specific habits of carefulness in definite activities; but during school life the deliberate type is put under considerable tension from the modern emphasis on speed. All college instructors know the leisurely student of fine intelligence who is absolutely disconcerted by the rush of college activities. Left to himself he would settle down for a prolonged study of the problem in hand; instead he is being constantly interrupted by the ringing of an alarm bell every sixty minutes. He finds the swift-moving routine of college life bewildering and if, by chance, he gets caught in the whirlpool of college activities he gets sucked under speedily. He cannot study calculus, sing in the glee club, be president of the Y. M. C. A., play football, debate, and fraternize all at one and the same time.

The American college

Not long since a student of this type proposed to me the handing in of a book review one year after it was due as an assignment. I offered him the book that he might refresh his memory of it. He looked at me in mild astonishment. He had read the book when assigned and expected to write his review of it from his year-old memory. How many of his punc-

tual classmates could have done the same? This is the temperamental type the college community needs but makes no modification of its routine to hold.

In the matter of temperamental training we shall assuredly need to reckon with innate differences in reaction to training as part of the problem. Until we are able to analyze out such differences we cannot venture to predict how far training can carry.

Margin of variability

The second question concerns the constancy of temperament from year to year, if we grant it an inherited foundation. That variations in temperament appear with age has already been stated. Moreover, if different temperamental traits ripen at different physiological ages and so appear at different epochs of development, modifications of temperament are certainly to be anticipated. The seven ages of man leave their imprint upon temperament as well as upon the body, and, moreover, temporary physiological conditions must have some effect on temperamental reaction. Hunger and satiety, freshness and fatigue, chill and fever, modify our reactions. The margin of variability may well be greater for temperament than for intelligence, and for one type (the cyclothymic) variability in reaction is a fundamental trait.

Back of all these reactions can we find a constant endowment, a permanent emphasis, that becomes bankrupt only under extreme pressure? An affirmative answer seems probable, but, as in the case of the intelligence quotient, conclusion must wait upon research.

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